

# CACTUS AND SUCCULENT JOURNAL

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FIG. 33. A medium sized Baobab gives shelter to a large specimen of *Euphorbia ingens*.



## CACTUS AND SUCCULENT JOURNAL

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THE SEEDLING FORMS OF THE  
LOXANTHOCEREI

Franz Buxbaum, *Kakteen und andere Sukkulantenkunde* Nr. 1, October 1949 (A Summary)

Translated by JOHN POINDEXTER

The seedling morphology of the cacti is often of importance in verifying or strengthening certain taxonomic viewpoints. Observations of this sort are carried out during the period when the cotyledons expand toward the sides of the seedling and the epicotyl begins its growth. The chief requirements are a good hand lens and a certain amount of drawing ability.

The branch of colored-flowered terete *Trichocerei* (A. Berger<sup>1</sup>), later named the *Loxanthocerei* by Backeberg form a close grouping over which there has been little argument. Certain short stemmed forms were placed with the Echinocactaneae by Britton and Rose, and neither Backeberg or Marshall have recognized the possibility that the genus *Oroya*, for example, might better be considered as a short-stemmed form of the *Loxanthocerei* line of evolution. It seems likely that the same would be true for the Genera *Denmoza*, *Arequipa*, and *Malucana*. Unfortunately none of these forms have been available for me to study in the seedling stage.

Three forms were studied in the preparation of this report: *Cleistocactus baumannii*, *Seticereus icosagonus* and *Morawetzia doelzianus*<sup>2</sup>. The succulence of the hypocotyl decreases to a slight degree with *C. baumannii* having the most succulent hypocotyl, and *Morawetzia* the least. Although all three forms end up with ribs, it is

interesting to note that as seedlings *Cleistocactus baumannii* starts forming ribs as soon as the second cycle of areoles begins, *Seticereus icosagonus* does not form definite ribs soon, but does have distinctly raised tubercles; and *Morawetzia doelzianus* does not have either ribs or tubercles.

In relating the seedlings of the *Loxanthocerei* to the cacti as a whole it might be pointed out that the *Cereus* No. 15, imported by Vatter, which is undoubtedly closely related to *Trichocereus huascha*, has seedlings which are usually very similar to those of *Cleistocactus baumannii*. Thus the nature of the seedling is a characteristic which is common to this whole line of development in the cacti and shows the clear relationship of the *Loxanthocerei* to the *Tricherei*.

It is hoped that this short report will serve as a stimulus, and as a take-off point for further work in describing the seedlings of cacti.

<sup>1</sup>Die Entwicklungslinien der Kakteen, Jena, 1926.

<sup>2</sup>The author states here that the use of these names does not constitute support for these generic names, which may have to be changed in the light of future investigations.

## SOME RESULTS OF TWENTY YEARS OF CACTUS RESEARCH—Backeberg

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FIG. 34. Huge trunk of an old Baobab tree near Messina in the Northern Transvaal.

## The Baobab of Africa—*Adansonia digitata*

By R. A. DYER

It is not unlikely that some readers on examining the accompanying photographs will say to themselves that they are looking at a tree and not a succulent. There are various ideas of what constitutes a succulent plant but probably all will agree that if a plant has reserve water storage capacity in either or both stem and leaves it qualifies for inclusion in this category. The main trunk of the Baobab is elephantine in proportion to the lateral branches and the reduction in circumference from the trunk to the branchlets is very rapid. The circumference of the trunk of a Baobab in Southern Africa is not infrequently over 75 ft. while that of one giant was almost 120 ft. The total height is rarely over 45 ft. and the combined lateral spread of the branches is often greater than the height of the plant. Somewhat surprisingly for such a grotesquely shaped tree as the Baobab, it produces most beautiful white flowers, which may be judged by the accompanying photograph. It is the thick woolly calyx lobes which are reflexed while the large spreading petals are crinkled and overlap. The perfume is not pleasant.

At one time a story was current that no young trees of the Baobab were to be found in the wild in the Transvaal because of the differences be-

tween young and mature plants, but the theory was eventually exploded. The reason for the inaccuracy is the fact that the leaves of trees of readily recognizable size have 3-7 lobes (as the fingers of a hand) whereas seedlings have undivided (entire) leaves and the stem does not immediately become conspicuously swollen.

The Baobab, also known as the Cream of Tartar tree, has few close relatives in the plant world and belongs to the family Bombacaceae. The genus *Adansonia* was named after a student botanist who travelled in Senegal, West Africa, during 1749-53 and whose specimens were brought to the notice of the great botanist Linnaeus. This and other interesting information was gathered into an article by Miss I. C. Verdoorn in the South African Journal of Science in 1933.

The distribution of the Baobab in Africa extends over a distance of approximately 5000 miles from Senegal to Eritrea, Abyssinia and thence South through Mozambique and into the northern Transvaal in the Union of South Africa. But the distribution is not continuous and the trees occur mainly in arid or physiologically dry habitats. There is a huge specimen known as the "big tree" which although not a

stone's throw from millions of gallons of water at the Victoria Falls between Northern and Southern Rhodesia, is in a physiologically dry habitat and the plants found on the sea coast of Senegal might be heard to lament: water, water everywhere and not a drop to drink. In Southern Africa the Baobab occurs in a region receiving between 10 and 20 inches of rain per annum. The trees in Africa are all regarded as belonging to the one species *Adansonia digitata* but other species of this remarkable, and no doubt very old genus, occur in Madagascar and Australia.

The huge trunk is supported within by a mass of fibrous tissue but there is no wood in the popularly accepted sense. The rest of the bulk is composed of soft water storage tissue which carries the plant through any prolonged drought.

Portions of the stem may rot or hollows may be induced by natives and the resultant cavities have been and possibly still do serve as water storage containers for the needs of the aborigines. Bees frequently make use of the hollows in the stems for their hives.

The Baobab is the refuge of several species of rodent, lizards and snakes and is a site chosen by many nesting birds including eagles. Baboons are fond of the tart pith within the fruits and natives followed their example and suck the pith as a means of quenching their thirst. Na-

tives also use the pith in the preparation of sour porridge. Certain natives, not in Baobab country, also show a great liking for making porridge out of partially fermented meal. The fibre of the tree also has its uses among the natives by whom it is used to make strong twine and a coarse rope.

Twenty-five years or so ago Europeans turned their attention to the Baobab with a view to paper manufacture. While the quality of paper was good the venture was abandoned, probably because of the low per cent of fibre and the somewhat remote occurrence of the trees in the Union of South Africa. Interest was again awakened in this project during the last war when paper was so very much in demand, but again it was abandoned, and as a protective measure the Department of Forestry has set aside a Baobab Reserve in the Northern Transvaal, which is a very wise precaution in this intensely commercial age.

When a Baobab dies, and quite a number of large specimens have done so in the Transvaal in recent years, they do not fall over as other trees do. They begin by dropping the ultimate twigs while rotting takes place within the trunk and eventually the whole mass sags into a heap of fibre. One observer states in *Park Administration* 27 (1951) that in some cases the moist decayed substance inside sets up internal com-



FIG. 35. Note the huge slab of sandstone which has been displaced during the growth of the nearer tree.



FIG. 36. (Left) Seedling of Baobab tree. Note the simple leaves. FIG. 37. (Right) The remarkable flower produced during midsummer in the Northern Transvaal. Note the divided leaves.

bustion and for weeks a fine column of smoke can be seen as the tree burns itself away. I can-

not say whether it would be letting off steam or going up in smoke.

#### STAPELIEAE—White and Sloane

The only monograph on the group of succulent Stapeliads. It includes 1 new genus, 30 new species, 25 new combinations, 3 new sections and descriptions, and complete illustrations of 349 species. Assembles and brings up to date all the information regarding these plants which are found chiefly in South Africa. This \$30,000 monograph is sold at cost in order to create greater interest in these plants. The descriptions are written in a clear yet unscientific style. Introductions contain valuable information for the student. Distribution of Species is practically a trip to South Africa and is helpful in the study of the flora of that country. Chronological Notes include introductions to all botanists who worked with these plants. Two and a half volumes devoted to descriptions of species and illustrations. The Appendix covers varied interesting subjects such as Cultural Notes and a Glossary. Three volumes of 1200 pages  $7\frac{1}{2} \times 10\frac{1}{2}$  in., 1250 illustrations with 39 in color. Still available at original price. Cloth bound \$12.50 per set; postage 75c, foreign \$1.75

#### SUCCULENT EUPHORBIEAE OF SOUTHERN AFRICA—

White, Dyer, and Sloane

The 1100 illustrations give this scientific work a human interest that appeals to students of this group

of succulent plants. There are 19 keys, full descriptions of 197 species, a glossary, bibliography, and cultural notes. This valuable contribution to the study of South African flora is scientific and yet readable for the layman. Beautifully printed on the finest paper to show the many photographs to the best advantage. This valuable monograph is essential to botanists, collectors, schools, colleges, libraries, and especially to African botanists. A priceless set of books that will never again be published. The two volumes contain 1000 pages  $7\frac{1}{2} \times 10\frac{1}{2}$  in., 1100 illustrations, 26 color plates. Bound in permanent Buckram cloth, \$12.00 per set. Postage, 50c; foreign, \$1.25

#### CACTI—J. Borg

First published in 1937 Professor Borg's book has proved a most valuable work for the keen amateur with its clear, non-technical descriptions of a very large number of species. The author died in 1945 and left the completed manuscript for a second edition in which are included another three hundred or more species and thirty-six additional illustrations. Professor Borg was not only an experienced botanist, but also had a very fine collection of Cacti at his home in Malta. 488 pages, 128 photos. Cloth bound. \$6.50

Abbey Garden Press, 132 W. Union St., Pasadena, Calif.



## ALAIN WHITE 1880-1951

By BOYD L. SLOANE

April 23, 1952, marked the first anniversary of the death of Mr. Alain C. White in Summerville, South Carolina. Mr. White passed away suddenly and peacefully of a heart ailment which had limited his activities during recent years.

To those who may not have heard the name of Alain White in connection with botanical literature, suffice it to say for the moment that Mr. White's name first appeared in connection with succulent plant literature in a series of articles entitled *The Stapelieae*, beginning in the September, 1931, issue of *The Cactus and Succulent Journal of America*.

Because of the great number of plant enthusiasts the world over who may have wondered at Mr. White's silence in recent years, and because of the requests which have been received asking for more information relative to this remarkable man, an attempt is being made to give a brief picture of him and of some of the activities in which he engaged.

Alain Campbell White was born in Cannes, France, on March 3, 1880. His parents were John Jay White and Louisa Lawrance (Wetmore) White who were residents of Litchfield, Connecticut, where they had first made their home in 1863.

The formal schooling of Mr. White began at Blake's School in New York City. This was followed by two years of travel in Europe. In 1898 he entered Harvard University and was graduated in 1902, receiving his A.B. degree, *magna cum laude*, in the field of Romance Languages. He then enrolled at Columbia University for post-graduate work, receiving his A.M. in 1904. His special research was done on the poetry of Dante.

The three special interests to which Alain White devoted his time over the years are chess, The White Memorial Foundation, and the succulent *Stapelieae* and *Euphorbieae*.

Mr. Vincent Eaton in 1941, in *A Sketchbook of American Problematisms* devotes an Epilogue to Mr. White and his work. Mr. Eaton asks the question, "What sort of person is Alain White...? He then describes him as a "young man of sixty-one summers, tall with just a slight suspicion of a stoop, doubtless acquired from the countless hours spent over a desk on the many projects that have occupied his life. He has an affable smile...and eyes that sparkle with zest as he talks."

"He has a young man's interest in everything under the sun, a youthful enthusiasm that keeps leading him, one might say driving him to break new ground.... He is tremendously interested in people. He likes meeting them, and helping them, without thought of reward for himself."

Mr. Eaton continues in telling of Mr. White's interest in chess to say, "For as composer, collector, writer, historian and critic, he has done more to serve and advance our little branch of the arts than any other American; more, it is safe to say, than anyone who ever lived." Mr. White said that he learned chess strategy from his father—picking it up over the back of his chair. His first chess problem was published when he was eleven years old.

"Perhaps his greatest achievement in the field of chess problems," says Mr. Eaton, "was the organization of a definite collection of all the worthwhile work that has been composed and published during the hundred-odd years since problems came to be viewed as something more than merely game positions."

"It was because of his guidance and inspiration that workers in a dozen countries labored, searching and sifting out old books and newspapers and magazine



FIG. 38. Alain C. White

files, seeking to recover and bring to one place problems that had never been systematically recorded or even remembered for more than a brief moment after their first exposure to public sight. More than a quarter of a million positions were brought together in this great Alexandrian Library of Mr. White's creation."

In 1905 Mr. White prepared the first of his Christmas Series of books on chess. These he had printed at his own expense and yearly, until 1938, when the series was discontinued, distributed them to his friends and correspondents at the Christmas season. Other books on chess were published by Mr. White until 1943. If the reader could but know in detail of Mr. White's service to chess, he would agree with Mr. Eaton as to the place of this service in chess history.

With the immense amount of labor involved in Mr. White's chess activities, one would think that he would have little time for anything else. Paralleling his work with chess, however, Mr. White was engaged in what he considered to be his most important work. And this work was of an entirely different nature.

As previously stated, the White residence had been in Litchfield, Connecticut, since 1863. Litchfield is in a county of the same name in the extreme northwestern part of the State. The county borders on both the states of Massachusetts and New York. The country in which it is located is beautiful with its rolling hills, forests, and quiet lakes. Harriet Beecher Stowe was born in Litchfield and in her writings mentions her early recollections of its beautiful scenery. This lovely countryside forms the locale with which the activities of the White Memorial Foundation are concerned.

In his Foreword to a report of the Foundation published in 1938, Governor Wilbur Cross says, "No one can read the story of the White Memorial Foundation without being deeply impressed by the broad outlook of Mr. Alain White and his sister Miss May White." Those who have known and worked with Mr. White through the years will feel that Governor Cross very happily stated in his remark about the "broad outlook" of Mr. and Miss White what many have felt.

The largest natural lake in Connecticut is Bantam Lake which lies near the center of Litchfield County and within sight of the White estate in Litchfield. Nearly fifty years ago Mr. White and Miss White envisioned the area of the Lake and its environs as a camping and recreational center. They believed that to be of the greatest value, the natural beauty of the area as well as the distinctive character of the Lake should be preserved. Then the bud of the idea began to blossom into the fruit of reality. Between 1908 and 1912, the Whites purchased several tracts of land along the shores of the Lake and along both sides of the Bantam River which flows into the Lake.

In the wisdom of Mr. White and his sister, plans were made so that the dreams which had begun to materialize should not fade away when their guiding hands were no longer at the helm. In May of 1913, the White Memorial Foundation was established and Mr. and Miss White conveyed most of the land which they had purchased to it. Later they purchased additional parcels of land and added them to those already held by the Foundation. The Foundation has now become the owner of more than sixty per cent of the shore line, and with other tracts acquired in Litchfield and Morris, has nearly four thousand acres in these two townships.

To support the Foundation and to their many gifts of land Mr. White and his sister added an endowment. The uses to which the property have been put are many. As early as 1908 Mr. White began the construction of a road through the woods to the north of the White residence. This beginning has grown till there are about twenty miles of private roads and trails through the property. In addition there are fifteen miles of public highway through the property or bordering its boundaries.

All nature lovers will be interested in the following quotations from the Story of the White Memorial Foundation: "Early in the list of improvements must come the story of plantings for forestation purposes which, with the natural growth, make the property peculiarly valuable to those interested in our native trees, and which may make it almost self-supporting in the years to come.

Along with the development of the woodlands have gone efforts to establish a sanctuary for wild bird life and to encourage the study of the flora of the region, represented in the plantings in the Wild Garden. Thus the natural resources of the tract, its trees, its wild life, and its flowers, are, as far as practicable, made available to lovers of nature through a well-rounded program."

The Foundation has supported many projects relating to health, recreation, conservation and natural beauty. From the brief sketch of this activity of Mr. White, one can sense his love of nature, of beauty, and his pleasure in doing for others.

The activities of the last of the three interests of Mr. White with which this sketch deals covers a period of twenty years. This is the time which was devoted to the study of Stapelieae and succulent Euphorbieae. Many readers have asked how this study came into being.

In 1931, Mr. White and his sister, Miss May White, were residents of Pasadena. At that time, the writer was president of the Cactus and Succulent Society of America. Mr. White knowing of the existence of the society and feeling that he would like to be more closely connected with some form of botanical study, asked if he might call upon the writer and see his plants. This meeting occurred in May, 1931. Succulents were the chief topic of discussion and, before Mr. White left, plans were made to collect succulents. At the time neither realized the infinite variety of such

a group of plants. Within two or three months a decision to specialize was reached and the Stapelieae were chosen.

Then the beginnings of a collection which was to become one of the largest of private collections of Stapelieae were begun. Trips to nurseries far and wide were made to search out the not too well known specimens. *Stapelia variegata* was the most common variety found. Others whose names were unknown were picked up here and there. It was not until importation was begun did there appear to be any considerable increase in the number of genera or varieties in the collection.

By September, 1931, the amateurs had gleaned sufficient information concerning the Stapelieae to warrant their sharing it with the readers of the Cactus and Succulent Journal. Their first article on the subject was published that month. The series of articles was continued until June, 1932. The result of this sharing was that much interest was created here and abroad. Contributions of plants, herbarium material and information were forwarded to The White and Sloane Stapelia Collection. The correspondence which began at this time with plant lovers all over the world was continued for years. Mr. White bore the major portion of the responsibility for this phase of the work.

Because of the great interest that was created by the Stapelia articles, the writers revised them, added much new material and published them in book form in September, 1933, under the title of *The Stapelieae*; An introduction to the study of this tribe of Asclepiadaceae.

This little volume was so well received and the correspondents' enthusiasm remained so high that Mr. White suggested that a complete monograph on the subject be prepared. This was to include complete descriptions of all known varieties together with notes on the distribution of the species and chronological notes dealing with collectors from 1624 to 1933. Due to the infectious personality of Mr. White and to the thoroughness of the work which he proposed, collaborators from all parts of the world assisted with gifts of plants, photographs, original drawings, description of new species and many other items. Finally, in 1937, a three volume monograph under the title of *The Stapelieae* was published.

But the end was not yet. While working on Stapelieae, Mr. White conceived the idea that another group of plants, the succulent Euphorbieae was of sufficient importance to warrant treatment similar to that which had been given to the Stapelieae. Again the task of collecting plants, photographs, information, etc., was begun. Friends of the Euphorbias rose to the occasion as friends of the Stapelias had previously done. To assist in this work and because of his wide experience with the flora of Africa, Dr. R. A. Dyer of Pretoria was invited to become a co-author with Messrs. White and Sloane. These three with the assistance of many collaborators completed the first two volumes of *The Euphorbieae* and they were published in 1941.

Upon leaving Pasadena, Mr. White and his sister took up their residence in Summerville, South Carolina. Not too long after going to Summerville, Miss White passed away. Her going deeply affected her devoted brother. Although plans had been made to add two volumes to the two already published, and although the work on the first of the two had really started, they seemed destined never to be completed. For here "in a hospitable home set among tall pines and magnolias" and in the woodlands he loved so well, Alain White fell asleep on April 23, 1951.

Few men have given so much with so little thought of reward.

## Methods of Collecting Cacti for the Herbarium and Botanical Garden

By ELZADA U. CLOVER

One of the greatest handicaps in a study of the Cactaceae is the lack of herbarium material even in some of the best institutions. It is regrettable that this interesting typically American family is so poorly represented. This may be accounted for by the fact that the plants collected for herbaria and Botanical Gardens are bulky and difficult to handle unless an expedition is properly equipped for it. It is understandable that curators of badly overcrowded herbaria begrudge the space necessary to house them. As a result of these difficulties many specimens in herbaria are scrappy, with even type specimens represented by no more than spine clusters, a single rib or often only a dubious photograph.

The first problem in planning an expedition is the provision of adequate drying equipment. This is preferably left at a base camp or laboratory where material from the field is received and made into specimens. The ideal drier is an electric one with a control for two or three different temperatures from low to a maximum of perhaps 160-165 degrees Fahrenheit. As a rule it is preferable to use low temperatures in drying plants to prevent brittleness. However, in the case of fleshy flowers it is necessary to use considerable heat if flower color is retained. Lacking electric facilities a rack may be made for holding presses high enough for a row of kerosene lanterns to be placed beneath. A poncho or tarpaulin placed around rack and press will hold the heat and at the same time protect material from dew and rain if the apparatus is set up out of doors. Presses may be put on cooking stoves of low temperature, lacking better facilities. The sun in dry desert areas serves fairly well. If one is travelling from place to place by automobile a luggage rack with cleats as a base may be used to carry numbers of presses at a time. These should be built up with ventilators and so arranged that air will circulate as the car moves. This is a very effective method and leaves the car interior free of this added impediment. A tarpaulin should be available in case of rain. Unfortunately, cacti often grow where no car can travel, and the collector must provide men and horses instead. Cacti weigh heavily and a man on foot may be able to carry only half a dozen plants the same distance that he could take two or three hundred herbaceous ones. If an extended trip is planned numbers of horses may be required for transportation. Rec-

tangular gasoline tins with the top removed, sturdy baskets and boxes all make satisfactory panniers for the pack saddle. Men on foot usually prefer to carry cacti in baskets. Some Indians carry them on the head for short trips where small collections are made. By far the best type of container for general collecting is a cone-shaped basket used by certain Indian tribes. A tumpline made of deer skin fits on the forehead or across the chest and a bushel or more may be carried with a minimum of effort. This burden basket may also be transported on the saddle by slipping the tumpline over the cantle. If this type basket is not available, rectangular ones about the width of a man's shoulders and two and a half to three feet long and equipped with straps as arm holes are satisfactory. These are particularly good on narrow trails where vegetation or crags interfere. Driers or cardboard should be placed inside next to the carrier to prevent injury from spines. Field tools needed are a pickaxe for digging, a machete and a small hunting or clasp knife. Some collectors carry large forceps and gloves for handling plants, but personally, I use nothing except a heavy fold of paper or cardboard to steady spiny plants while cutting them. Gloves can become a nuisance particularly if *Opuntia* and *Nopalea* are handled, as glochids become embedded in them and may be felt for weeks. An abundance of slender rope is invaluable in tying awkward packages on horse or car, and in mending saddles and bridles. Epiphytic cacti can be pulled from high tree limbs by attaching a small rock to one end of a rope which is then thrown over the desired plant. It is always a problem to get sections of large organ-type cacti to the ground without breakage. To cut down the entire tree seems a great waste, and besides, often the fall will ruin the desired specimen. Usually a tree can be climbed without serious difficulty. The climber fastens a rope securely near the center of the portion to be cut, holds the rope taut, cuts the stem and lowers it to the ground. He can also collect juicy fruits and flowers in bags which are then lowered without injury.

In selecting material for the herbarium, one should study plants carefully before collecting so that characteristic specimens will be obtained. In such genera as *Acanthocereus*, *Epiphyllum*, *Binghamia* and others, the young plants are completely unlike mature ones. *Hylocereus* may



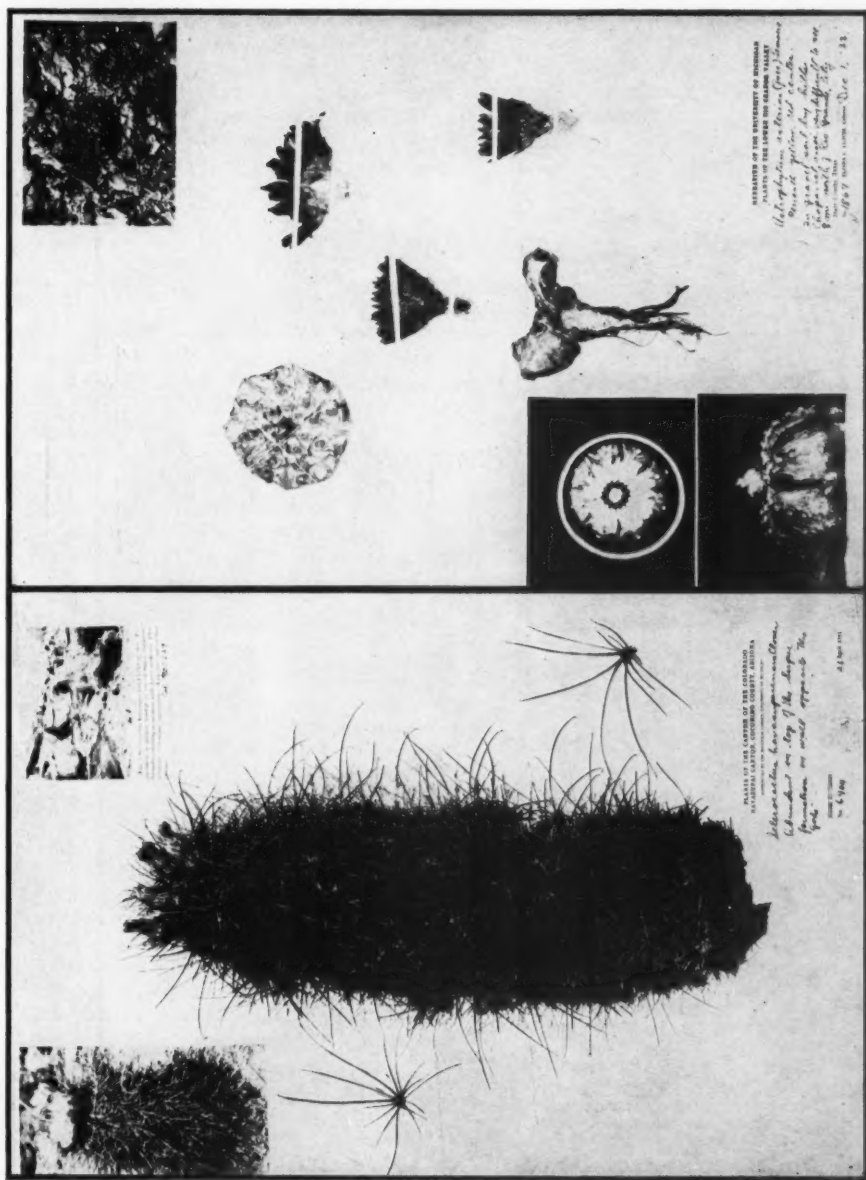


FIG. 39. (Left) *Sclerocactus havanensis* Clover. Flowering habit shown (upper left); habitat, (upper right). The plant has been split lengthwise, the central cylinder removed. Spine clusters are mounted at the sides. FIG. 40. (Right) *Astrophytum asterias* (Zucc.) Lemaire. Photograph (upper right) shows the plant in natural habitat. During dry weather the roots contract pulling the stem down so that the top is at ground level. Flowers are mounted so that inner and outer parts are shown.

have as many as four or five different forms on a single plant and if seen separately the amateur is apt to consider them as so many species. Shade forms of many cacti are quite different from those growing in full sun, for instance, species of *Mammillaria* has short whitish spines as it is found under shrubs, and a part of the same clone in full sun may bear long spines tinged with

red. Some species with considerable range from north to south may be so different at either extreme as to scarcely be recognizable as belonging to the same species. Differences in altitude cause such changes as difference in habit, i.e., more or fewer branches or a greater or less number of flowers per areole as in the case of some *Myrtillocacti*. Soils and moisture influence

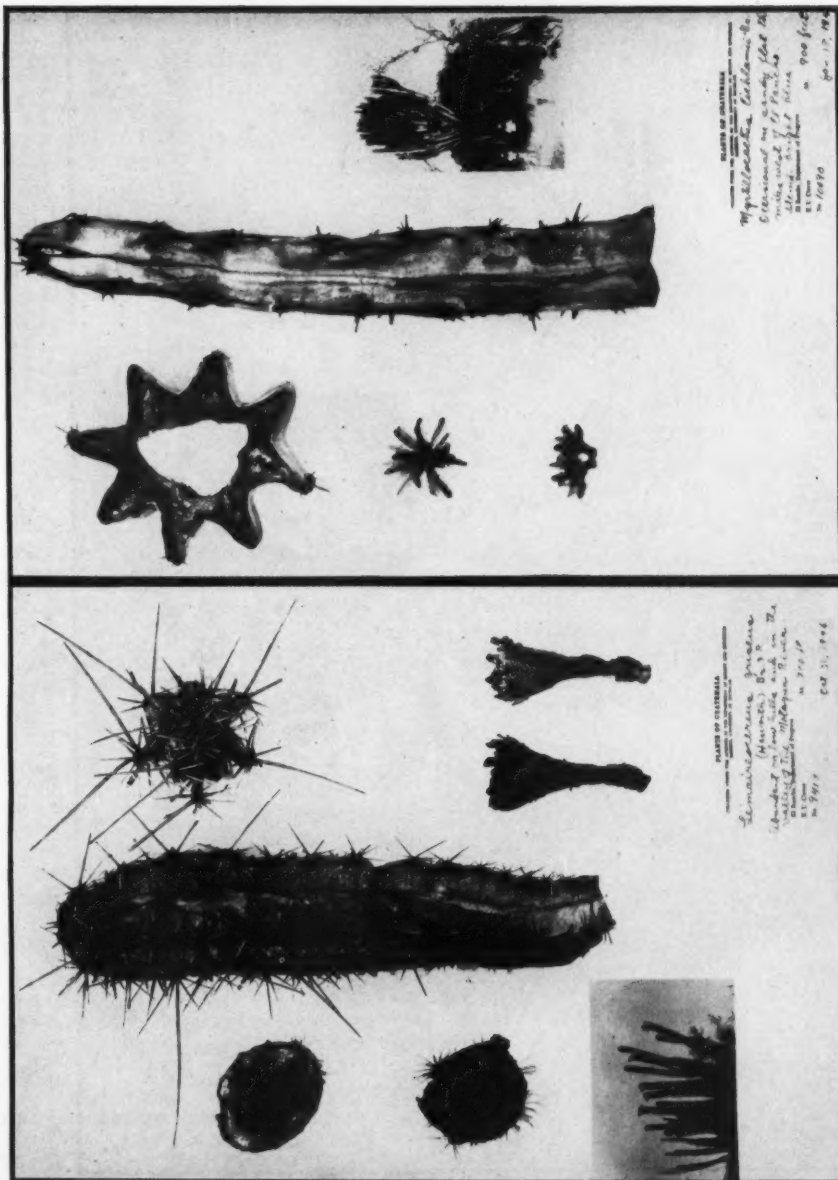


FIG. 41. *Lemaitreocereus griseus* (Haworth) Br. & R. This is a tree-like plant with massive branches. The central section is a terminal branch with the central cylinder removed. Surplus flesh has been pared away. (Upper right) tip of stem showing spine arrangement; (lower right) median section of flower. In this and other species spine clusters become detached from the fruit at maturity and are easily rubbed off. The lower fruit shows spines still attached, the upper has lost most spine clusters. FIG. 42. *Myrtillocactus Eichlamii* Br. & R. (Right) Central section shows a longitudinal section of two ribs, or one-fourth of the stem; the cross-section (upper left) permits a total rib count and shows the approximate diameter. Flesh is removed from the center to speed drying and to decrease weight on the sheet.

growth and form in many species so it is always advisable to re-collect the species in different environments.

Globular and cylndric species small enough to fit on an herbarium sheet may be split lengthwise, the central cylinder and excess flesh removed and the plant placed in a single folded newspaper sheet between driers and put in the

press. If a natural shape is desired the halves may be placed in the sun for several hours. The cut layer forms a dry peel which is easily removed, after which the plant is placed between driers and pressed during the night. Whether over heat or not, considerable moisture will be removed from the cut sections. These may again be placed in the sun and the process repeated.

In many respects such plants as *Mammillaria*, *Dolicothele* and other tuberculate forms are easier to determine and look much more realistic when not greatly flattened. Such specimens require more space in an herbarium which is a point against this method.

*Epiphyllum* and species with similar flattened stems cannot be split and should have the epidermis scraped from one side for rapid drying. Plants that require sectioning should be cut in lengths of about a foot. They are then split lengthwise. Such slender cylindric forms as *Selenicereus* and *Nyctocereus* may be pressed without the removal of tissue unless particularly robust; angled forms such as *Hylocereus* and *Acanthocereus* may dry better with the central cylinder removed or at least split. These are sometimes very woody and difficult to cut in *Acanthocereus*. The very slender stems of *Rhipsalis* are dried entire.

There are several methods of preparing such large stems as those of *Cephalocereus*, *Lemaireocereus* and *Myrtillocactus*. Cross-sections are always made in these as in all other globular, cylindric or angled forms, and at least single ribs cut lengthwise showing spine clusters and pseudocephalium if present. In my opinion it is almost as easy and certainly a better practice to cut the section in half lengthwise, remove the greater part of the flesh and press the halves. It is usually necessary to remove the woody cylinder. Sections should be selected to show the tip, a median area, and an old region. If these large specimens are dried to retain the original shape, do not remove much flesh as specimens will curl and buckle in the sun. If dried material seems fragile it is well to fill cavities with cotton to prevent breakage. Specimens may be mounted this way.

In most cases pads of *Opuntia* and *Nopalea* can be split lengthwise. Some of the flesh should be removed as it is mucilaginous and resists drying. New growth showing leaves should accompany mature pads. This cannot be split but occasional slashes through the epidermis will facilitate drying. Where the habit is not known, roots should be examined and tuberous ones collected.

*Pereskia* and *Peresklopsis* are difficult to press satisfactorily as leaves are apt to fall. Leaves on slender stems will press better than on heavy ones. There is great difference in spine characters on old and on young stems, and these genera should have bark from larger branches and from the trunk of tree-like forms represented in the collection. Some fruits should be split in two lengthwise and others cut in cross-section.

Several methods are used to speed the drying

of cacti besides the use of heat, all with some measure of success, all with some disadvantages. Plants may be dipped in hot water to kill the cells. This method speeds drying of forms pressed entire, and it is particularly good in the preservation of such succulents as Crassulaceae, fleshy *Euphorbia*, and other similar forms. Formaldehyde in a 10% solution is sometimes used. Plants are allowed to soak in the solution for varying lengths of time, depending on the nature of the material. Many people are allergic to the formaldehyde or dislike the odor, and it is expensive and difficult to carry into remote places. The application of salt to cut surfaces is an effective way to remove water from cacti in dry regions of southwestern United States and northern Mexico. Near jungle areas and in other places where air is moist this process is not strongly recommended. Salt is placed on cut surfaces as plants are spread out on the floor or ground. They have to be tilted occasionally to remove the water which collected, and more salt applied. This is a rather untidy process particularly in the house. I prefer placing the sections in a single newspaper sheet preparatory to pressing. The salt is then applied, two or three driers placed on either side of the plant, the press tied firmly and tilted up on edge so that water may run out readily. After a few hours the driers are changed and the press placed over any heat available. Driers will become very wet and should be changed frequently during the first day. Plants so treated will usually dry within twenty-four hours or less. Flowers should not have a salt application.

*To be continued*

EXTRA! EXTRA! EXTRA!  
PLACE AND DATES OF 1953 CONVENTION  
Arcadia, California, July 10-12, 1953

Desert field trip to Devil's Garden, Twenty-nine Palms, Joshua Tree National Monument and Palm Springs, July 13 and 14. Trip through Hollywood and along the seashore to Santa Barbara and return through the famous San Fernando Valley, July 15.

Arcadia at the foot of the mountains, fifteen miles east of the Los Angeles City Hall, has been selected for our meeting place as it offers good accommodations and is well situated in regard to various points of interest. Across the boulevard from headquarters are the great Santa Anita Race Track, Arcadia County Park and Lyon Pony Express Museum. One mile away is the new State and County Arboretum on the grounds of the Lucky Baldwin homestead. Five miles away are the world renowned Huntington Botanical Gardens and California Institute of Technology.

There's a story about a fellow who visited Heaven and was being shown around. In surprise he inquired about some that were chained up. His guide replied in disgust, "Oh those Californians! If we don't keep them chained up, they'll all go back home. Especially those folks from Arcadia."

This convention will start on Friday morning, so we will have the afternoon free for a bus trip to points of interest. In fact, there will be trips every day for six days.

HOWARD E. GATES

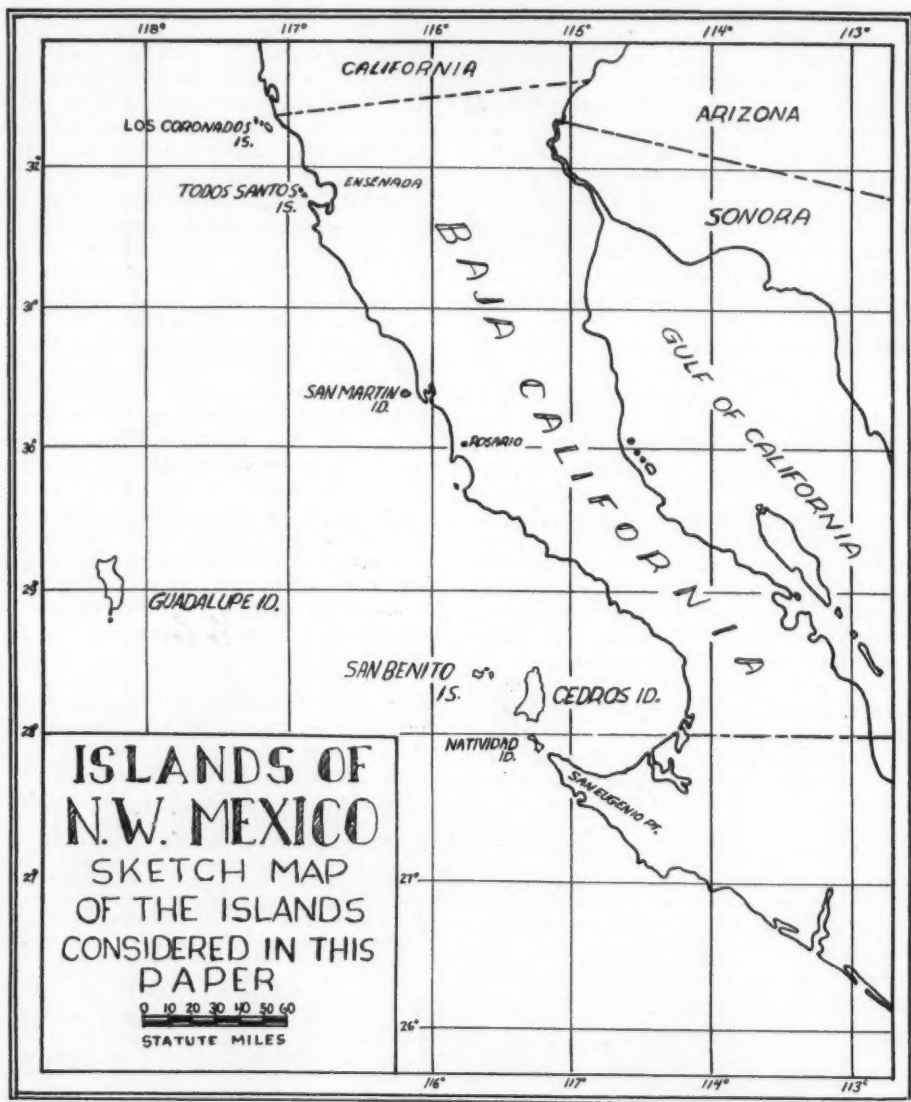


FIG. 43



## Mammillarias of the Islands Off Northwestern Baja California, Mexico

By GEORGE LINDSAY and E. YALE DAWSON

During the month of October, 1846, the British frigate *Herald* visited Isla de Cedros, Baja California while engaged in a survey of the west coast of America. There the ship's surgeon, M. J. Goodridge, collected a small, hook-spined *Mammillaria*. The plant was turned over to Dr. Seemann who joined the expedition as naturalist in January, 1847. Seemann in turn forwarded the plant to the German botanist Scheer. The little plant apparently survived its various voyages, but died in cultivation without having flowered. From the sterile specimen Scheer named the species *Mammillaria goodrichii*, honoring Goodridge whose name he misspelled. Like many catalogists of his and later times he apparently did not preserve the type.

Many of the mammillarias of Baja California and of the adjacent islands have seemed to agree with the inadequate original description of *M. goodridgei*, and as a result several different species have been referred to it. As few collections have been made on Isla Cedros, recent supplemental descriptions of *M. goodridgei* have been drawn up from material from other localities. The result has been that recent and widely accepted descriptions purporting to be of that species are actually composites of several species. All of the plants which will be considered here

have at one time or another been classified as *M. goodridgei*.

In 1938 the senior author had opportunity to collect briefly in the vicinity of the village on the southeast side of Isla Cedros and found two specimens of *Mammillaria goodridgei*. The plants were in a very dry condition and did not survive the trip home. In the spring of 1948 he again visited the island and with Reid Moran found flowering specimens of the plant. As the flowers proved to be small, inconspicuous and cream-colored it was evident that the description of large pink flowers did not apply to this species. This discovery led to the investigation of the insular Mexican mammillarias treated here.

During the years from 1948 to 1951 one or both of the writers have visited each of the larger islands of Northwestern Mexico and have made collections of the mammillarias growing on them. Each of the plants has been observed in flower in the field or through cultivation of the living plants collected. Not only were unsuspected relationships found between the insular plants and those of mainland Baja California, but it has been possible to clarify both the circumscription and distribution of *Mammillaria goodridgei*.

### KEY TO THE SPECIES

- A. Flowers deep pink; tap root absent.....1. *M. blossfeldiana*  
var. *shurliana*
- AA. Flowers white to cream or yellowish; tap root present or absent.
  - B. Axils of tubercles naked or only slightly lanate, without bristles.
    - C. Stems simple, developing a definite tap root.
      - D. Hooked central spines present; stigma lobes olive-green.....2. *M. goodridgei*  
var. *goodridgei*
      - DD. Hooked central spines absent; stigma lobes deep red.....3. *M. goodridgei*  
var. *rectispina*
    - CC. Stems commonly branched; roots fibrous, not developing a tap root.....4. *M. hutchesoniana*
  - BB. Axils of tubercles bearing bristles and more or less lanate.
    - C. Hooked central spines present; axils with sparse wool.....5. *M. dioica* var.
    - CC. Hooked central spines absent; axils densely lanate.....6. *M. neopalmeri*

### 1. MAMMILLARIA BLOSSFELDIANA

Bödeker var. SHURLIANA Gates

Fig. 44

Gates, 1941, p. 78; Craig, 1945, p. 184. *Mammillaria goodridgei* Scheer, as interpreted by Craig, 1945, as to Isla Guadalupe material only.

Plant body globular to sub-columnar, usually simple, rarely branched, to 10 cm. tall and 5 cm.

in diameter, with fibrous roots never enlarged to form a tap root; tubercles round, blunt, compressed at the base, the axils slightly lanate; central spines 3-4, all with bulbous base, 6-10 mm. long, the lower one hooked; radial spines 16-22, 5-8 mm. long, acicular, black at the tip, horn-colored at the base; flowers broadly funnel-form, 2.5 or up to 3.5 cm. in diameter; outer

perianth segments deep pink to brownish red with light pink margins; inner perianth segments 12-16, oblong, mucronate, deep pink with lighter margins; anthers yellow; filaments cream-colored; stigma lobes 6-8, long-linear, olive-green; style pink; fruit clavate, orange-red, 2 cm. long, 6 mm. in diameter; seeds black, small, less than 1 mm. in greatest diameter, smooth to pitted.

TYPE: Holotype is *Gates s.n.*, May 17, 1935, No. 326566 in the Dudley Herbarium, Stanford University, California.

TYPE LOCALITY: Five miles west of Rancho Mesquitál, Baja California, Mexico (28° 30' N., 113° 55' W.).

DISTRIBUTION: Restricted areas in central Baja California in the vicinity of Rancho Mesquitál and Calmallí, and on Isla Guadalupe.

The species of *Mammillaria* inhabiting Isla Guadalupe has been confused with *M. good-*

*shurliana* and has found insufficient differences to separate them. Although the original description of var. *shurliana* calls for only three central spines, the type has four centrals in most areoles. The Guadalupe plant seems to differ from the type only in the presence of pitted rather than smooth seeds.

The insular distribution of *Mammillaria blossfeldiana* var. *shurliana* seems to be confined to the more arid southern half of Isla Guadalupe where it grows inconspicuously among the lava rocks. Plants were observed growing on the mesas at the southern end of the island, and also on small Isla de Afuera, lying about two miles south of the main island. Two specimens, each with several heads, were collected on this islet, but the great majority of the plants on the main island were simple.

SPECIMENS EXAMINED: *Isla Guadalupe*—Lindsay 540, April 10, 1948 (Dudley Herb.); Lindsay 1820, Feb. 1, 1950 (Dudley Herb.). *Baja California*—*Gates s.n.*, May 17, 1935 (Dudley Herb.); *Gates s.n.*, June 21, 1950 (Dudley Herb.).

## 2. MAMMILLARIA GOODRIDGEI Scheer var. GOODRIDGEI

FIG. 45

Sheer, in Salm-Dyck, 1850, p. 91 (as *M. goodrichii*); Scheer, in Seemann, 1856, p. 286 (as *M. goodridgei*); Craig, 1945, p. 181 (as to type only). *Cactus goodridgei* (Sheer) Kuntze, 1891, p. 260. *Neomammillaria goodridgei* (Scheer) Britton & Rose, 1923, p. 158 (at least as to the Cedros Island material), *Cibinia goodridgei* (Scheer) Orcutt, 1926, p. 2.

Plant body globose to cylindrical, to 8 cm. tall and 4 cm. in diameter, occasionally branching at the base but seldom with more than 2 or 3 branches, deeply seated in the ground, tapering at the base to a prominent tap root; tubercles about 5 mm. long, obtuse, widened laterally to 5 mm., flattened dorsiventrally; axils of tubercles naked; central spines 3-5, brown, the lower one hooked and to 6 mm. long; radial spines 10-13, straight, spreading, lighter colored than the centrals; flowers cream-colored, funnellform, 15 mm. long and 15 mm. broad; outer perianth segments 6-8, acute, cream-colored with a broad maroon mid-stripe; inner perianth segments 7-8, 3 mm. broad, obtuse, cream-colored with a very pale pink blush from the ventral maroon mid-stripe; anthers yellow; filaments pink; style yellow to pink; stigma lobes 6, to 3.5 mm. long, olive-green; fruit clavate, red, to 2.5 cm. long with persistent perianth; seeds smooth, black with small round hilum.

TYPE: Not extant.

TYPE LOCALITY: Isla Cedros, Baja California, Mexico.



FIG. 44. *Mammillaria blossfeldiana* var. *shurliana* Gates.  
Lindsay No. 540.

*ridgei* since the time of its discovery by Edward Palmer in 1875. Floral characteristics of the Guadalupe plant were incorporated in an expanded description of *M. goodridgei* by Craig (1945, p. 182) who figured a flowering specimen from Isla Guadalupe as that species. Our present information indicates that the Guadalupe plant cannot be considered to be *M. goodridgei*. The senior author has compared living Guadalupe material with the type and with living topotype specimens of *M. blossfeldiana* var.



FIG. 45. *Mammillaria goodridgei* Scheer var. *goodridgei* growing on Isla Cedros, April 23, 1948. Approx. natural size.

**DISTRIBUTION:** Known definitely only from Isla Cedros where it is widely but sparsely distributed along the south and east sides of the island.

Many of the mammillarias of Baja California and adjacent islands are similar in body characteristics and can be distinguished from each other only when in flower. As a result of the incomplete original description, several different entities have been referred to *M. goodridgei*. Engelmann assigned to that name the San Diego plant which later was described as *Mammillaria dioica*. Britton and Rose (1923, p. 159) referred to it specimens from Punta Abreojos and Mulegé, Baja California which are very probably representative of other species. Craig (1945, p. 182) included in *M. goodridgei* the large-flowered plant from Isla Guadalupe which is treated here as *M. blossfeldiana* var. *shurliana*.

*Mammillaria goodridgei* is apparently restricted to Isla Cedros. The writers have searched for it without success at Bahía San Bartholomé and at Punta San Eugenio on the adjacent coast of Baja California. Howard S. Gentry, who has recently surveyed the flora of the Sierra Vizcaino, has indicated to us in personal communi-

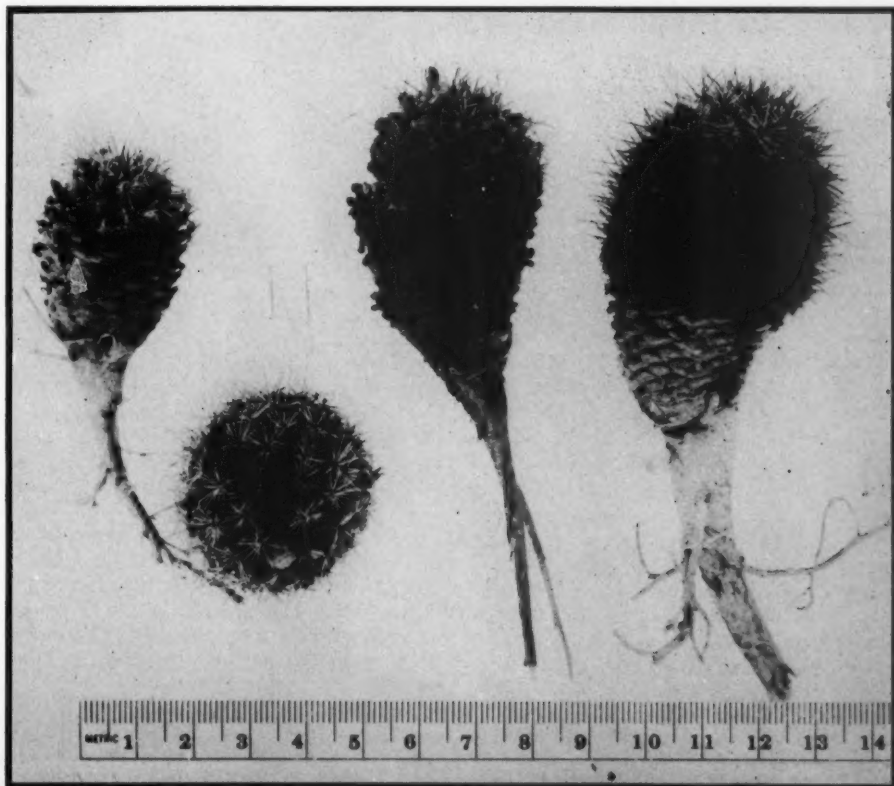


FIG. 46. *Mammillaria goodridgei* var. *rectispina* Dawson. Specimens from the type collection, Dawson 10631.

cation that he does not know it to occur there.

This species seems not distantly related to *Mammillaria dioica*, but differs from that plant in having smaller flowers, a thick tap root, axils without bristles, and smooth seeds.

**SPECIMENS EXAMINED:** *Isla Cedros*—Lindsay 554, April 24, 1948 (Dudley Herb.); Lindsay 571, May 1, 1948 (Dudley Herb.); Dawson 6120, March 4, 1949 (Herb. Hancock); Stewart s.n., July 19, 1905 (Herb. Calif. Acad. Sci.).

### 3. *MAMMILLARIA GOODRIDGEI* var. *RECTISPINA* Dawson var. nov.

Fig. 46

Corpore simplici, 2-4 cm. diametro, radice prominenti; axillis tuberculorum nudis; spinis centralibus 4, rectis, inferioribus interdum ad extremam partem curvatis; spinis radialibus 14-18; floribus 17 mm. longis; segmentis perianthis albis vellateis, fascia rosea; lobis stigmaticis roseofuscis; seminibus nigris, 600  $\mu$  diametro, leviter foveatis.

Plant body globose to cylindrical, tapering to a prominent tap root, 2-4 cm. in diam., normally simple, deeply seated in the ground, projecting only 1.5-2.0 cm.; tubercles about 5 mm. long, subconical, rounded; axils naked; central spines usually 4, 7-8 mm. long, straw colored with brown tips, all straight, or the lower one sometimes with a curved tip, but not hooked; radial spines 14-18, straw colored, spreading, 4-5 mm. long; flowers to 17 mm. long, not opening widely but remaining open several days, often profuse and ultimately borne in nearly every axil; ovary 2 mm. long; tube about 4 mm. long; perianth segments lanceolate, white to cream colored with a rose-red mid-stripe; anthers yellow; style greenish-white; stigma lobes about 7, deep rose-red; fruit slender, to 15 mm. long, 3.0-3.5 mm. diam., light red; seeds black, lightly pitted; the withered perianth persisting but readily detached.

**TYPE:** Holotype is Dawson 10631, April 21, 1951, preserved in alcohol in the herbarium of the Allan Hancock Foundation.

**TYPE LOCALITY:** Ridges and steep hillslopes at elevations of 600-800 feet immediately overlooking the Punta Norte lighthouse, *Isla Cedros*, Baja California, Mexico.

This straight-spined little plant has been found in fair numbers only in cracks of rocks on the windy ridge-crests of the type locality. Its habitat is well separated from that of the hook-spined type variety which in the Punta Norte area grows only on stony flats near the shore. This new variety is similar to simple specimens of typical *M. goodridgei* in form, size, spination

and in the presence of nude axils and a prominent tap root. However, the straight central spines (sometimes slightly curved at the tip), the deep red stigma lobes and lightly pitted seeds distinguish it.



FIG. 47. *Mammillaria butchisoniana* (Gates) Böd. A cultivated specimen of Lindsay No. 572.

### 4. *MAMMILLARIA HUTCHISONIANA* (Gates) Bodeker

Fig. 47

Bodeker, in Backeberg & Knuth, 1935, p. 387; Craig, 1945, p. 179. *Neomammillaria butchisoniana* Gates, 1934, p. 4.

Plant body simple to cespitose, to 15 cm. tall, the stems 4-6 cm. in diameter; roots fibrous, never forming a tap root; tubercles short, conic, compressed at the base, olive-green; axils naked or very slightly lanate; central spines 4, 7-10 mm. long, light tan with purple tips, at least the lower one hooked; radial spines 10-20, straight, purple-tipped; flowers 2.5 or to 3.0 cm. in diameter; outer perianth segments about 12, cream-colored with a maroon mid-stripe; inner perianth segments 6-10, lanceolate, to 2 cm. long and 7 mm. wide, cream colored; stamens numerous; anthers yellow, minute; stigma lobes 7, 5 mm. long, linear, green; style cream; fruit clavate, 2 cm. long, scarlet; seeds black, smooth or punctate.

**TYPE:** Holotype is Gates 121, July 22, 1933, in the Dudley Herbarium, Stanford University.

**TYPE LOCALITY:** Eight miles west of Calmallí, Baja California, Mexico (28° 15' N., 113° 40' W.).

**DISTRIBUTION:** Central and southern Baja California from Sierra San Borja to south of La Paz; *Isla Natividad*.



Although the original description calls for 25-35 radial spines and only 3 central spines, the type specimen shows 4 centrals and 15-20 radials. Mr. Gates collected a series of *M. butchisoniana* in July, 1950, in which a great deal of variation was evident. We now feel that the distribution of this species is rather wide through Baja California. Craig (1945) considered *M. bullardiana* from near La Paz to be synonymous. Plants which also seem referable to *M. butchisoniana* have been observed at San Borja, at Santa Gertrudis and at San Francisquito.

Isla Natividad is separated from Isla Cedros and Punta San Eugenio only by narrow channels

7 and 4 miles wide respectively, yet *M. butchisoniana* apparently does not occur in these latter areas. The abundance of the plant on Isla Natividad is probably to be accounted for in part by the scarcity of rodents on the barren island. Only a small, white-footed mouse is known to occur there.

SPECIMENS EXAMINED: *Isla Natividad*—Lindsay 572, April 28, 1948 (Dudley Herb.). *Baja California*—Gates 121, July 22, 1933 (Dudley Herb.); Gates s.n., June 1950 (Dudley Herb.); Brandegee s.n., April 10, 1897 (Herb. U. C. Berkeley).



FIG. 48. *Mammillaria dioica* K. Brand. var. growing on Isla San Martín, May 3, 1948.

## 5. MAMMILLARIA DIOICA K. Brandegee

FIG. 48

K. Brandegee, 1897, p. 115; Craig, 1945, p. 161. *Neomammillaria dioica* (K. Brand.) Britton & Rose, 1923, p. 158. *Mammillaria fordii* Orcutt, 1902, p. 49. *Chilita fordii* (Orcutt) Orcutt, 1926, p. 2. *Mammillaria incerta* Parish, in Jepson, 1936, p. 549.

TYPE: Holotype not designated, but possibly represented by one of two specimens collected by Brandegee near San Diego and deposited in the herbarium of the University of California, Berkeley.

TYPE LOCALITY: Not designated, but probably in the vicinity of San Diego, California.

DISTRIBUTION: Coastal areas and eastward into the desert in San Diego County, California; Pacific Coast of Baja California; Islas Los Coronados; Islas Todos Santos; Isla San Martín; Isla Margarita.

Since the description of this species more than half a century ago from collections obtained near its northern limits of distribution, the exploration of the deserts to the east and of Baja California to the south have brought to light numerous plants of varied habit and morphology which have been referred to this species. It has been unfortunate from the point of view of subsequent investigators that the dioecious plants originally described of this apparently widespread and variable species represent an exceptional rather than a usual character of the plant. The dioecious condition is not frequently observed, and moreover, is not confined to *M. dioica* but occurs occasionally in other species such as *M. neopalmeri*.

In its varied habitats through ten degrees of latitude from foggy cliffs overlooking the sea to arid interior desert ranges subject to great temperature extremes, this plant exhibits not only a wide range of characters of body form and spination, but also of flower and fruit size and form. Two dissimilar flower forms occur, sometimes more or less mixed in a population. In one form (Craig, 1945, fig. 142) the flowers are rather small, with relatively short, blunt perianth segments which do not spread widely and are not reflexed. In the other (Fig. 48) the flowers are larger, widely spreading to as much as 4 cm., and with long, acuminate, strongly reflexed perianth segments. At the same time, two distinctive fruit forms may occur, the longer clavate form shown in figure 48 and a shorter, more ovate form.

From this brief statement of some of the variability of the plant it may be clear that much additional study will be required for an adequate understanding of this species complex, and that to present here another description of some segment of the complex is pointless. We must

await thoroughgoing genetic studies not only of material collected throughout its range, but of its reproductive variability within a restricted population. Such studies of restricted populations may best be carried out in one of its island habitats of which there appear to be three or more.

Plants which vegetatively appear unmistakably like those of the adjacent mainland occur commonly on Islas Los Coronados. Flowering material has not yet been obtained or observed at this locality. On Islas Todos Santos large clumps of *M. dioica* were observed by the senior author near the south end of the southern island. Although no critical observations were recorded, it is certain that at least some of the plants exhibited the large flower form as in figure 48. On Isla San Martín the plants were in flower and fruit among the lava rocks at the times of our visits in May of 1948 and of 1951. Figure 48 serves to show both the vegetative and reproductive characters of a well-developed example at this locality.

INSULAR SPECIMENS EXAMINED: *Islas Todos Santos*—Brandegee s.n., Mar. 10, 1897 (Herb. U.C. Berkeley). *Isla San Martín*—Howell 10720, Aug. 19, 1932 (Herb. Calif. Acad. Sci.); Lindsay s.n., May 5, 1948 (Dudley Herb.); Dawson 10633, April, 1951 (Herb. Hancock).

## 6. MAMMILLARIA NEOPALMERI Craig

FIGS. 49-50

Craig, 1945, p. 267. *Mammillaria dioica* var. *insularis* K. Brandegee, 1897, p. 115. *Cactus palmeri* Coulter, 1894, p. 108. *Neomammillaria palmeri* (Coulter) Britton & Rose, 1923, p. 140. *Chilita palmeri* (Coulter) Orcutt, 1926, p. 2. *Mammillaria palmeri* (Coulter) Bödeker, 1933, p. 43 (non *Mammillaria palmeri* Jacobi, 1856, p. 82).

Plants cespitose, to 15-20 cm. tall and to 25 cm. in diameter, consisting of several to many (20-30) stems 6-7 cm. thick, with fibrous roots not forming a tap root; tubercles obtuse, to 6 mm. long; axils of tubercles densely lanate, and bearing 1-several white bristles; central spines 4, straight, to 7 mm. long, white with brown tips; radial spines 18-26, spreading, straight, white, to 5 mm. long; flowers to 2 cm. long; outer perianth segments about 6, lanceolate, obtuse; inner perianth segments about 8, to 10 mm. long and 4 mm. broad, cream colored; stigma lobes 4-5, olive green; fruit red, clavate, to 25 mm. long and 8 mm. thick, bearing the persistent perianth; seeds black, slightly pitted.

TYPE: Holotype is Palmer 921, March 23, 1889, reported to be in the U. S. National Herbarium.

TYPE LOCALITY: Islas San Benito, Baja California, Mexico.



FIG. 49. *Mammillaria neopalmeri* Craig, growing on West Island, Islas San Benito, April 18, 1948.

**DISTRIBUTION:** Known only from the three islands constituting the San Benito group. It apparently does not occur, as has been reported by Britton & Rose and by Craig, on Isla Guadalupe.

On March 25, 1889, Edward Palmer visited the San Benito Islands and made a small collection of plants which included this *Mammillaria*. Vasey and Rose (1890 (p. 24) first reported it as *Mammillaria goodrichii*, after which J. M. Coulter described it as *Cactus palmeri* in 1892. Katherine Brandegee, in 1897, after describing *Mammillaria dioica*, renamed the San Benito plant as *M. dioica* var. *insularis*, showing that Coulter's name could not be used in the genus *Mammillaria* because of the earlier *M. palmeri* Jacobi representing a different plant. Britton and Rose used the name *Neomammillaria* to replace Haworth's *Mammillaria* which is a later homonym of the algal genus *Mammillaria* Stackhouse. Thus, they were able to retain Coulter's name and called the plant *Neomam-*

*millaria palmeri*. The genus name *Neomammillaria* was not widely accepted, and in 1930 the International Botanical Congress acted to conserve *Mammillaria* Haworth, 1812, over *Cactus* Linnaeus, 1737 and 1753, whereupon *Mammillaria* Stackhouse was rejected in favor of *Gigartina* (Stackhouse) J. Agardh. In 1933 Bodeker placed *Cactus palmeri* in the genus *Mammillaria*, not realizing that the name had been used previously for a different plant. In 1945 Craig renamed the plant *Mammillaria neopalmeri* inasmuch as *Mammillaria insularis* Gates had preoccupied that combination for this species.

*Mammillaria neopalmeri* was in flower on two of the writers' visits to the islands (April 18, 1948, and February 5, 1950) but not on April 26, 1950. Remple's collections of mid-July, 1937, were in fruit. Both perfect and unisexual flowers were observed, although the perfect ones were more common. Some plants exhibited a few hooked central spines. These

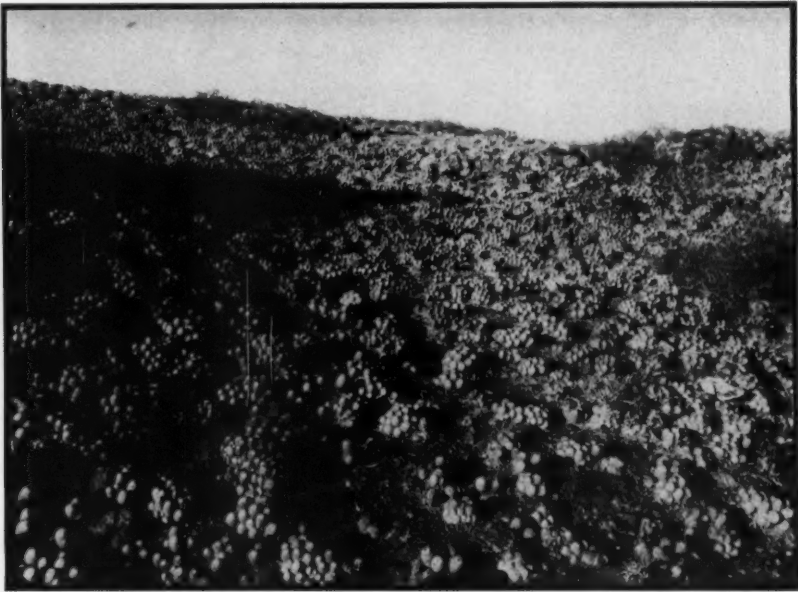


FIG. 50. *Mammillaria neopalmeri* Craig. Such a dense stand as this covers nearly all of Middle Island, Islas San Benito. Photographed Feb. 5, 1950.

morphological characters suggest relationship with *M. dioica* and may lead some systematists to retain K. Brandegee's varietal status for the plant. However, *M. neopalmeri* may be distinguished from *M. dioica* not only by its distinctive cespitose habit, but by its straight central spines and densely lanose axils. Physiological differences which appear important have yet to be determined.

This species occurs abundantly on all three islands of the San Benito group, but especially on Middle Island. There the species is the dominant plant and forms the heaviest stands of *Mammillaria* the writers have ever seen. The abundance is probably physically correlated with the absence of herbivorous rodents on these small islands, and physiologically with an extraordinary tolerance for high nitrate and phosphate in the soil. The plants abound in the nesting areas of the multitudes of sea birds (pelicans, gulls, cormorants) which inhabit the islands and often appear to be growing in virtually pure bird guano. It seems not unlikely that physiological study of this plant may reveal genetic differences from near relatives reflected in these salt tolerances.

**SPECIMENS EXAMINED:** Anthony 278, 1897 (Herb. U.C. and Dudley Herb.); Stewart 9, July 14, 1905 (Dudley Herb.); Lindsay 1819, Feb. 5, 1950 (Dudley Herb.); Rempel 364, 356, July 14-15, 1937 (Herb. Hancock).

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FIG. 51. Howard Gates and Beatrice Barad in author's garden at Corona, California. Creeping Devil Cactus in foreground was collected in Lower California.

## MEXICO

By HOWARD E. GATES

The new central highway from El Paso, Texas, to Mexico City is truly the high road. It dips below four thousand feet only in a few short sections and rises to nearly eight thousand in two places. It follows an upland mesa route between the great Sierra Madres of the east and the west.

The first day and a half's route through Chihuahua wound over the long slopes between small ranges of mountains but seldom entering them. This is mostly cattle country with small towns except for the large city of Chihuahua which sits beside a river, usually dry, between small ranges of hills in which are rich mines. Native trees are seldom seen except along the infrequent rivers. There is a large area beyond Chihuahua around the town of Delicias, which is under irrigation. While there are many kinds of cactus in Chihuahua, they are mostly small types in the mountain ranges and seldom noticed while travelling the highway.

In the next State of Durango, vegetation is more plentiful and there are stands of larger arborescent *Opuntias*. Near the city of Durango, *Opuntia durangensis* is plentiful and in the autumn its fruits are sold in the markets and on the streets for eating fresh. Just west of Durango is Sierra Mercado, known locally as the Iron Mountain. It is an immense hill of highly colored iron and manganese ore. Cactitians know it as the type locality of *Mammillaria mercadensis* and *M. xanthina*.

As we were approaching Durango just after dark in a light rain, a farmer decided to drive a few cows across the highway. This resulted in a fatality amongst

the cows and a badly crumpled fender for us. A light truck took us in tow and as we passed the police outpost at the edge of the city, a policeman riding a bicycle and waving a flash light, took up the task of leading the caravan to a motel named for Pancho Villa. Pancho was a revolutionary leader in this territory some thirty-five years ago. Today his memory is honored here in his birthplace though other districts consider him a glorified bandit leader. It took three days to repair the fender damage, so we became quite well acquainted with Durango, a city of some seventy thousand persons.

As with most Mexican cities, it is compact and does not cover nearly as large an area as our cities of similar size. The buildings are usually of brick or the sun dried bricks known as adobe and covered with stucco. The residences as well as commercial buildings follow the usual Mexican custom of coming to the side walk line with the garden located in an interior court yard or patio. The windows are barred with iron or wooden grills. In the newer residential sections, the better homes are set in gardens which usually have low walls or combinations of walls and metal fences on the property lines. The cathedral is a twin towered building several hundred years old. Another prominent building is known as the New Church because it is only seventy-five years old. The residents are proud of their monument to The Flag, which is an imposing shaft set on the toe of a hill at the edge of the city. Below the monument is an excellent park numbering amongst its features a swimming pool built to Olympic specifications. Nearby are elaborate and colorful stucco build-

ings containing the dressing rooms and pumping equipment. In the heart of the city is a large market building where nearly everything needful for human existence may be secured at one or more of the stalls.

Going on from Durango, the highway passes through territory with increasing rainfall. Consequently there is a still better vegetation. As it was near the close of the summer rainy season there were flowers everywhere. Pink cosmos and orange yellow coreopsis were abundant. There is more farming here than farther north. Some of the cities we passed through are located near large mines and are notable for great heaps of mill and smelter refuse in their outskirts.

Near Zacatecas, we stopped for lunch at a quaint new yet very old tourist resort. It is featured by about thirty great conical structures built out of clay and rock which are said to be Indian granaries several hundred years old. Originally there was but a single door at the ground level and a hole in the peak through which the grain was poured. Now they are being converted into apartments for tourists. Each one is large enough for a living room and two large bedrooms on the ground floor and two bedrooms on the second floor. Around them are gardens planted to *Pachycereus marginatus*, *Echinocactus ingens*, *Ferocactus latispinus*, *Opuntias*, *Agaves* and *Yuccas*. In the public dining room are elaborately carved and very old tables and high backed chairs.

A short distance beyond the city of Leon we turned off the highway for a few miles to the Comanjillo Spa. Here we found a large hotel building set in a grove of trees, with several swimming pools in the grounds before it. Behind the building at the foot of the hills is a large hot springs formation with water and steam bubbling out in numerous places. We were especially interested in a hedge planting of large *Lemaireocereus* with individual plants reaching a height of twenty feet. Unfortunately they were not in flower or fruit, so the species was not determined.

On the way back to the highway, we photographed small native trees bearing large white flowers with a maroon center spot. Later we found them to be quite widely distributed. The native name of it was too much of a tongue twister for us to remember. As we neared Queretaro, we saw for the first time large stands of tall native cactus other than the *Opuntias*. These were *Myrtillocactus geometrizans* and *Lemaireocereus queretaroensis*, usually on low hills where the soil was too rocky for cultivation. Both kinds attain a large size with many branches. As we passed by Queretaro we saw a long line of masonry arches built in colonial days to carry an aqueduct into the city. Many of the old cities have this form of aqueduct. Morelia has an excellent example.

Beyond Queretaro we soon began to climb up from the mesa country into mountains. Higher and higher we went until we came into pine forests. On many of the high ridges were little clearings where the Indians have corn patches. Some are so steep it seems as though the farmers must hang on with one hand while they work with the other. Mexican farmers do not keep the weeds out of their fields. Probably this is a good custom as it prevents erosion. We found a great many types of houses in Mexico. In this section there were homes of adobe brick topped with red tile roofs.

We entered Mexico City from the west passing from Toluca over El Desierto de los Leones. Strangely this section is not a desert and there are no lions. It is a mountain range covered with pines. Since it is a national park with numerous resort areas it is a favorite Sunday and holiday resort for the metropolitans. Bicycles, usually of British makes were very numerous.

Many of the young men are members of cycling clubs. Girls and women are seldom seen on bicycles.

We found accommodations at a hotel on the Paseo de la Reforma which is the grand boulevard leading at an angle from the rectangular heart of the city to the great recreation grounds around Chapultepec Castle. In the center of this boulevard is a narrow bed filled with cactus, mostly *Ferocactus* and *Echinocactus* accented by *Pachycereus marginatus* and a few white haired *Cephalocereus senilis*. On both sides of the cactus bed are four lane highways flanked by broader parkways filled with grass, large trees, monuments and benches. Outside of these recreational parkways are two lane driveways giving access to the adjoining buildings. The boulevard may only be crossed at intervals of about four blocks, where circular islands filled with plants and monuments guide the traffic in a continuous whirling flow into usually six radials plus the lateral service streets. The stranger soon realizes that Mexico City's drivers are either the world's best or most reckless. To complicate matters, pedestrians pay no attention to traffic signals nor traffic officers. Also it is most disconcerting to drive a few blocks on a street and find that its name has changed. Very few streets run their full course under one name. As is the case in most Mexican cities whose old narrow streets are inadequate for present day traffic needs, many of them are one way. Parking problems vary with the city and portion of the street. Sometimes parking is permitted on the left or only on the right, or sometimes on both sides. Mexican cities formerly had a reputation for noisy traffic as the drivers sounded the horn at every intersection and on the slightest pretext elsewhere. Now most of the cities strictly prohibit the use of the horn and street signs read, "No toca su klaxon. Usa su frenes."

Mexico City has had a tremendous growth in recent years. Its very old buildings are intermingled with modern many storied structures of most advanced design and built to the strictest of specifications. It might be said that many of them are built on boats. Originally, Mexico City's site was a lake bed. This was drained, leaving a very unstable terrain to build upon. To prevent settling, earth enough to balance the projected building's weight is excavated and the hole lined with concrete as the first step in the construction of a multiple storied building. Space does not permit the telling of the vendors of little potted blooming orchids, of the great six to eight foot funeral wreaths, the boys on bicycles carrying a couple of bushels of bread rolls in the upturned brim of a great palm leaf hat or many other interesting things.

There are few cactus to be seen in Mexico City's environs as the altitude of seven to eight thousand feet is too high. Even though Mexico is the native home of four or five hundreds of kinds of cactus plants, certain elevations, types of terrain and areas with certain rainfalls must be sought.

We turned off the main highway north east of Mexico City near Pachuco and passed over the continental divide at Mineral del Monte. Here we found a pine covered ridge of mountains honey combed with mine tunnels. On the farther slope we passed through a large valley with several towns and numerous farms. The fields of sun flowers and other types of wild flowers were very attractive. Farther on the slope gradually steepened until we descended to a forest of *Myrtillocactus geometrizans* and *Lemaireocereus dumortieri* with some scattered *Opuntias*. The *Dumortieri* especially were interesting as the short trunks soon branched into a candelabra group of many short spined, erect, angular branches. At last a long winding grade brought us to the bottom of a tremendous can-

yon. Quite a river of water meandered in the bottom between farms of oranges, avocados, corn and miscellaneous products. On the steep banks of the canyon and down to the bottom but never on flat ground, were thousands of *Cephalocereus senilis*, usually called the Mexican Old Man Cactus. This was the consummation of a cactician's fondest hopes, yet it was rather disappointing. The Old Men were all the way to twenty-five or thirty feet high but only the top few feet was white hairy. Lower much of the hair had weathered away and the remainder was dirty and dark. The cephalium or part where the flowers and fruit are borne, appeared as an extra hairy, darkened and elongated oval spot on one side, a short distance below the tip of the branch. The commonest form of this plant is a simple column but many of the older ones had several tall branches arising from the base and closely paralleling the central column.

In several places on the lower slopes and ridges were *Echinocactus ingens* colonies ranging from small almost globular plants to great barrels five or six feet high. All of the larger ones were constricted with several horizontal bands and the lower spines were weathered away. The bulges between the constrictions brought to mind the memory of some portly gentleman who wore his belt too tight. Scattered through the undergrowth were *Dolichobothris longimamma*, *Mammillaria parkinsonii* and *M. sempervivi*. Some six feet off the ground a four headed *Parkinsonii* was growing in a crack in a horizontal branch of a tree. Of course this oddity became the subject of a kodachrome slide.

As we arrived late in the afternoon, it was necessary to seek lodgings in a roadside village in the canyon bottom. The combined kitchen and dining room in the cafe was dark and primitive but the meals were tasty and the room for the night was clean and the bed very comfortable. This was the only place in Mexico where we were tricked. On the way into the canyon, we had given a ride to two native pedestrians. When settling accounts in the morning, we found these two men had eaten their evening meal and charged it to our account.

Then back into Mexico City for another night and off again on the Vera Cruz road. In the vicinity of Mexico City, the continental divide forms a great N and it is crossed twice on the route to the east coast. The first crossing on the eastern edge of the great bowl in which Mexico City is cradled, is amongst the rugged pine covered mountains at over ten thousand feet, just a few miles north of the perpetual snows of Ixtaccihuatl Volcano. The eastern slope leads downward into the great valley in the heart of the State of Puebla. In passing through an apple and pear growing district, the roadside was dotted with colorful stands of the women fruit sellers. A few miles west of the City of Puebla, a country district was dotted with great numbers of churches with no great population to be served. Enquiry disclosed that in colonial days, there was a large Indian population in this district. Wherever the missionary priests found an idol, they destroyed it and erected a church. One of the churches rests upon an ancient pyramid that had been covered with earth. There is said to be a church for every day of the year in this district of Cholula.

Though Puebla is given in our books as the type locality for many cactus both large and small, a traveler will pass through without seeing any save an occasional *Opuntia*. It seems as though the early botanists selected good spots for their headquarters and carelessly ascribed their finds to the headquarters rather than the actual spots where the plants were found. Beyond Puebla, the highway follows valleys

between ridges of low hills to the second crossing of the divide which is a low ridge at Cacoloapan. On these ridges are some *Opuntias* and scattered *Mammillarias* of several kinds including the very beautiful *M. Collina*. It is globular and covered with short, snowy white spines. No large *Cereus* were seen except in and near Cacoloapan where scattered colonies of *Lemaireocereus stellatus* grew on the hills and were planted for fruit bearing hedges around the homes. The greenish fruit ripens in the fall and is freely sold for food in the open air market under the native name that sounds like Chaw-co-nist-lay.

The country beyond the continental divide is lower and became increasingly arid as we followed the highway to Tehuacan, which is given in our books as the home of more large cactus than probably any other spot in Mexico. Nothing of any consequence to the cactician other than scattered *Opuntias*, *Mammillarias* and a few colonies of *Ferocactus robustus* were seen on the way. This last forms immense clusters compactly filled with several hundred four to five inch heads. Both the flowers and fruit are yellow. One plant formed a circular mound about eight feet in diameter and several feet high.

Tehuacan is a city of some twenty thousand set in a broad agricultural valley with no cactus in sight. So it was with considerable mis-givings that we sought lodgings at little Villa Granada in the mineral springs resort area in the north edge of the city. A large tile floored twin bed room with tile bath, opened out onto a wide veranda facing a beautiful garden containing a half a dozen kinds of palms and many plants we do not even know at home. There was a big swimming pool, constantly replenished with a stream of clear water flowing from a mineral spring.

In the morning we passed on through the city and across the valley on the road to Zapotitlan de las Salinas. Within a few miles we started to ascend a winding road over the hills and cactus began to appear. First there were good stands of *Echinocactus grandis* with scattered *Mammillaria mystax* and *Coryphantha pallida*. Two boys with a flock of feeding goats came our way and as we talked with them, we noticed one of the goats reach over into the crown of a giant *Echinocactus* to pick out a ripe fruit, chew it up and discard the woolly remains. A little farther on and in the canyons as well as on the hills we found the gigantic *Cephalocereus tetezo*. These have short trunks surmounted with numerous erect branches each bearing a crown of longer and weaker brown spines. Beyond the first ridge we came into a rugged canyon whose walls were forested with the single stemmed *Cephalocereus hoppenstedtii*. Though not as hairy as the Old Men, their whitish spines made them stand out in sharp contrast to the dark hillsides. In the bottom of the canyon were scattered plants of *Myrtillocactus schenckii* which are more erectly branched than *M. geometrizans*.

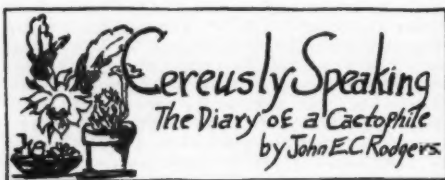
To be continued

#### WILD FLOWERS OF THE CAPE OF GOOD HOPE—

Rice and Compton

Although not primarily concerned with succulents, this beautifully-illustrated work can be considered background material for properly understanding our own favorites in relation to their place in the general flora of South Africa. Here in color are many of the strange and gorgeous plants, mostly little known in our gardens, that one sees mentioned so often in accounts of African collecting trips. Twenty-three succulents are here too, many not previously figured. 24 pages of text, 250 colored plates illustrating 444 species, \$7.85

ABBEE GARDEN PRESS



## MARCH-APRIL

The response to my plan for *Cereusly Speaking* for 1952 as set forth in the January-February JOURNAL was more than gratifying, so I shall continue with my observations, thoughts, philosophies, etc., in my next four or five articles. The "cactus fever" has not abated. In fact, I'm sure there are more with cactusitis than most of us have realized.

Spring is just around the corner again and nice weather helps one see the least variations in the greenness of his plants. To me the "awakening of my interest" in my collection seems to be the year around. There are some that seemingly forget their plants during the resting season and get excellent results. Carl Henscheid, Rupert, Idaho, stores his plants in a cool greenhouse and lets them rest. We who saw his Kodachromes in Denver at Red Rocks Park last July can agree with him that his methods get results. He specializes in Echinopsis, Lobivias and Rebutias.

I'm following his recommendations with these three genera this year. I've got them in the coolest spot where they'll get the most sunshine and the least water has kept the plants in good form. Only the Rebutias have budded so far but they usually bloom early in March for me while the Lobivias and Echinopsis bloom in May, June, July and August. I'm willing to try anyone's methods that get these two to bloom freely. I don't.

I do not mean that one can treat all cacti and succulents this way. Each one must be checked as to the best way to treat it. This means close observation and note taking for most of us. Epiphyllums can stand more "studied neglect" than I give them but they must also be "coddled" when buds appear. The adult plant in large pots, tubs, buckets, etc., of yesterday did bloom profusely after being stored in a cool dry basement and watered infrequently.

This plant had root room, good garden soil and good diffusion of the limited moisture given to last for the duration of storage while setting buds and getting new growth. Now with the small basements "treated against moisture," with heated recreation rooms and basements and with the "cool basement—limited—water-treatment" idea still prevailing, the small potted Epiphyllum is now really neglected. Such treatment brings out a need for new methods. I've experimented with two old, well-grown *Epiphyllum Ackermannii*—one in a tea keg and the other in an 18 inch clay pot in this storage dispute. The limited watered plant in the pot stored in a cool spot with plant food watered in from February to July wintered best. The tea keg one stored cool but kept "dry" gradually lost "foliage" and the roots died back which the new summer growth failed to replace. The results confirmed the letters that I had received. Grandma's ideas must become modified for our newer comfort for comforts sake if the large plants keep that nostalgic wail "but my mother didn't have any trouble with cactuses" from drowning out the satisfied customers. I've talked to some of the grandmothers—yes, they too remember fine plants grown in the coolness of the uninsulated, unstorm windowed, unfurnished-house with unmoisture-proofed sand stone or tile cellar walls. The best plants I've seen are still grown in the "unregenerated vigorous wintered un-

conditioned places but our winter-comfort program is slowly pushing the big Epiphyllums the way of the large ferns, begonias and rubber plants which took a cool fresh-aired, well lighted place in the 1890-1920's period. You don't hear of "snow on the rivers" these days. Even the doctors advise against draughty rooms: "Air your sleeping rooms thoroughly before retiring then close the windows." Tropical conditions of heat without the fresh air and tropical moisture which the plants enjoy—spells the doom of our "grandmother's plants" as well as her "green-thumb." You no doubt have read about the reservoir of hot water on the side of the old coal or wood stove and the steaming tea kettle era of moisture control. Here the windows were frosted over (with a newspaper to protect her plants at night and her lace curtains were washed only in the spring and fall. There was plenty of fresh-air.

When I first began collecting cacti and succulents, there were still many large Epiphyllums standing in shaded locations in city, village and farm house yards. Now we have the "real comforts" of life along with "the common cold" and the Epiphyllums have "lack of health and few flowers if any." (Note—build yourself a greenhouse for your plants and endure "the cold.")

If this is true about us, do people in Europe still grow "nice plants?" The answer is "Yes." Miss Kathryn Hageman, a friend of ours, spent four months in Germany and Austria and visited England and Switzerland. She has Kodachromes which show the conditions of grandmother's day still produce comparable house plants as well as cactus and succulents in tin cans, metal buckets, wooden tubs and fancy pots.

You of the more favored climates (California, Florida, etc.), who do not have to coddle your plants and can let nature take care of them (one way or the other!) must remember "In the weatherman we trust" but often must depend upon ourselves and use greenhouses.

The spring feeding program either with liquid or dry fertilizers can be overdone as well as "under done." I still advocate a good fresh soil for most cactus and succulent needs but I do use some of the "wonder-working" plant foods which are seen at the Flower Shows, florists and "5 and 10's." Several people have asked me what I thought of Hyponex, Plant Tabs, Vitamins, etc. I like them when I'm in the "non-potting-fever-stage" which is two frequent I'm afraid. There is no substitute for the well-drained soils that have the bone-meal-sand-gravel-humus composition. Of course I live close to river, lake, and creeks sand and gravel reserves and have a large back lot which I have built up over a period of years with coal ashes, leaf humus, etc., so I do not need artificial stimulants. Everything is here and my plants show it.

No, I've not got wings. I do get good rejuvenation results with worn out soils if I use Hyponex and add extra vitamins. I know there is as much danger with too rich soils as with too much chemical plant foods. Plump plants like plump people do not always show a healthy condition. I've observed that a restricted diet means a much longer lived plant (but not always a profuse bloomer as some people say). Soggy soils do not always spell the doom of a plant either but it's better to be on the safe side. "Moss" on the top of a pot of soil is supposed to keep air away from the roots but I've plants that have "moss" and pots of the same variety that do not with both plants in "good health." I'm partial to the green covering for the Epiphytes where the roots are prone to cover the top of the soil and get "baked." I use Lake Erie water and "moss spores" are in it at all times. (Note again I'm not fussy, just a "laissez-faire" gardener.)

*Continued in next issue*



## ROUND ROBINS

There has been decided progress in the activity of the Round Robins since last we met in this column. The letters and cards have been coming in so well, you have kept me on my toes every minute.

In looking over the notes I have made at various times, I came across some interesting ones taken from the letters of Miss Rose E. White of San Rafael, California. These might well have gone into an earlier issue of the JOURNAL but I believe that cactus news is never out-dated.

In one of the former Robins, Miss White had some interesting items on *Ceropegias*. She had enclosed a pressed flower from her *Ceropegia stapeliiformis* which gave us an idea of the size and markings. She wrote, "It bloomed from July through November (and still has buds in January). A few blossoms opened every day throughout that time. I've lost all track of the number. I was most surprised at it being so prolific since this is its first year to bloom and it has the same habit as the *Hoya* of sending out its blossoms on the flowering stalk of the previous year. Warning! When you are tempted to pick the little bunch of *Hoya* blossoms growing on the single stem, remember, you are using next year's blossoms as well as this year's. *C. stapeliiformis* has only one blossom to each stem. These last about three days, then dis-attach themselves at the base and fall to the ground. My plant is about 8 feet long, growing up the side and across the roof of my greenhouse as one single stem with no branches until it began to bloom. Then it formed many small stems on which the flowers were borne. It grows in an unheated greenhouse, warm in the summer and cold and dry in the winter. I consider it the most exotic plant I own as you Robins might expect from the number of times I've mentioned it. My *Ceropegias* do far better when hanging down. I have seen them planted in a 6-foot, heavy bamboo planter that was swung from the top of the greenhouse. They grow down rapidly, the ends can be nipped off, re-rooted readily, and so the box can be filled very soon. *C. debilis* is another fine little trailer that would add interest to the group. I would tuck in a *Sedum morganianum* in one corner for contrast, for it, too, must have a place where it can grow down two or three feet."

I rather liked what Miss White had to say about our JOURNAL and I should like to share it with you. She wrote, "The Journals are good reading and you get more general information from them than from any number of books on succulents. The early volumes had many more articles for amateurs than they do now. In fact, you get the feeling that the JOURNAL has just grown up very normally over a period of 20 years of intensive study of the subject and you can grow up right along with it in reading from the early issues up to date."

A bit of advice was given by a *Euphorbia* member. Never fertilize any *Euphorbia* that is not beginning to show new growth or already growing vigorously. As soon as a *Euphorbia* plant begins to turn yellow, and the leaves become dry and drop off, it is usually a warning that the soil is too wet or too acid. Transplant or repot in fresh soil at once.

Here is a list of newcomers to the Robins: Dr. G. L. Berry, Oklahoma; Mr. Gary R. Baker, California; Mr. J. W. Dodson, California; Mr. Lawrence Gallant, Pennsylvania; Rev. L. Gamston, England; Mr. E. S. Gourlay, New Zealand; Mrs. F. B. Hanson, New Zealand; Dr. Edward J. Heath, New Jersey; Mr. George D. Hewitt, England; Mr. Walter M. McEver, Georgia; Mrs. Charles K. Minson, Oregon; Mr. Philip M. Plimer, Texas; Mr. Donald Ralston, Ore-

gon; Mr. Russell A. Redler, Louisiana; Mr. Sidney Rosenberg, New York; Mr. Albert D. Trundy, Maine; and Mrs. H. Willis, Texas.

Cactus and Succulent R. R. No. 6 has started on its way. Cactus and Succulent R. R. No. 7, which is for "men only" is ready to fly this week with eight members in it. This Robin was organized so quickly, I am wondering if we shouldn't start another one like it. *Haworthia* R. R. No. 1 is ready to try its wings this week, also. Mrs. Hanson and Mr. Gourlay of New Zealand, requested this Robin some time ago and have been waiting for members here to join them. I am sure they will be glad to see the Robin at long last.

Where are the *Echeveria* fans? So far, there has been no response.

*Mammillaria* R. R. has four members in it and when a few more have been added to it, this Robin will be on its way. We have our youngest member in this Robin, Mr. Gary Baker, who writes me that he will have his sixteenth birthday in another month. Are there any others of the same age who would like to have a Robin of their own? Mr. Baker writes that he has well over 250 different cacti and succulents and of these, he takes the most interest in his 39 species and varieties of Mams.

Any new ideas for Robins? They will be most welcome, so send some along on a postal.

I like to be busy so keep the postals and letters coming!

MABEL H. FAY

123 North Avenue, N. Abington, Mass.

EDITOR'S NOTE: We like the comments about *Ceropegia stapeliiformis* and the *Euphorbia* advice as extracted from Round Robins by Mrs. Fay.

## QUESTIONS and ANSWERS

Conducted by  
HARRY JOHNSON  
Paramount, Calif.



**Question:** Last summer I received an Orange Baby Toes (*Fenestraria aurantiaca*). As per instructions I put the small pot into a 3-inch pot and filled it with coarse sand. It grew beautifully until February when it seemed to be outgrowing the small pot and the outside toes were drying where they came into contact with the pot rim, so I reset the plant into the 3-inch pot and placed it in a 4-inch pot. Since then the toes grow spindly and shrivel. Some grow quite tall and crack in two or three places. Mrs. Donald Golladay, Maryland.

**Answer:** *Fenestraria aurantiaca* grows in a very dry part of Southwest Africa in the sand along the coast. In the wilds only the tips of the leaves with their lucent windows appear above the sand and they are difficult to find except at flowering time when the dunes are bright with their marigold-like blossoms. In cultivation they grow above the soil and one must be careful of water. Like other "window" and mimicry plants their resting period is from

June to September. During this time they resent much water and only enough should be given to prevent undue dessication. In the early fall they flower and during the winter ripen their seed. Since the days grow progressively shorter and sunlight less frequent one should not try to get much growth during winter. Undoubtedly your plants are in a warm room with temperatures of perhaps 70° or above. The air is surprisingly dry and there is considerable transpiration. If possible keep the plants away from radiators. A cooler room where temperatures fall to 40° or 50° would be much easier on the plants. Your description of the plants shows they are receiving too much water and not sufficient ventilation. If they were put in a cooler room they would need very little water. The trick is not to start them into active growth late in the fall. Get a few normal leaves early in fall while there is still sunlight to harden them and it is still possible to give adequate ventilation. Many growers overlook the necessity of ventilation while plants are in growth. Plants are a lot tougher than you might think and almost everyone is inclined to err on the side of giving too much protection. The more you give the more must be given. My *Fenestrarias* get little coddling. They are protected from rain in winter and from heavy frosts and are given as much air and sunlight as possible. During the winter they grow very slowly if at all. Some of the plants are over fifteen years old and are planted three to a six or seven inch fern pan.

*Question:* Repotted my Crown of Thorns last year and wintered it in my greenhouse where it bloomed sparingly all winter. It is now, Feb. 29, getting many new buds. One branch has two flowers coming out of center of one flower. One stem has six flowers and out of these twelve new blossoms are coming. The plant is about twelve years old. Are such flowers rare or common? Frank W. Muchow, Jr.

*Answer:* No, such phenomena are not rare. I checked over several hundred plants and found quite a number of similar proliferations. To understand it one should know what such "flowers" as are found in *Euphorbia* really are. The so-called flowers is really a condensed inflorescence or flowering branch and is technically called a cyathium. The resemblance to a flower is almost perfect and few but trained morphologists would detect this fact unless it were explained. The general branching of the plant is dichasial and the order in which the organs of the cyathium ripen is centrifugal (from the center outwards) which is a tip-off. In the center is a single female flower without petals. It is on a long stalk and consists of an ovary with three carpels surmounted by a 3-

rayed stigma which ripens before the stamens. The stamens are numerous and each stamen represents a single flower. You may see this is so for each "filament" is jointed, the joint representing all that is left of the original flower but the single stamen. The inner stamens ripen first. Around the stamens is a perianth-like organ of generally five parts, these are really bracts not petals. Between the bracts are four u-shaped or horn-like bodies which are the combined stipules of these bracts. In a few species of *Euphorbia* these bracts are large and brilliantly colored like petals. In Crown of Thorns two of the bracts are developed to good size and this is the "flower" you know. The Poinsettia is another well-known example. One may easily see why such "flowers" often produce secondary flowers.

*Question:* How is it possible to keep my cacti clean looking, particularly the woolly ones like the Old Man and Snowball Cactus? I live in a city apartment and grow my plants on the window sill and naturally there is some soot. Mrs. Paula Peck, N. Y. C.

*Answer:* I am afraid there is no real answer to this except complete air conditioning. However, a client wrote me that she regularly gave her "Old Man Cactus" a shampoo! It did not seem to hurt the plant and it did keep it white. Perhaps other readers have had the same experience. To keep our plants fresh and sparkling white we grow them in cold frames.

*Question:* My problem is to name my plants as my customers want the correct names. Others must have the same problem. How can I name them? Mrs. Muriel M. Peel, Canada.

*Answer:* There is only one real way for the beginner. Don't buy plants unless they are named. However, almost every collector will buy an interesting plant and then hope to find its name by conning his library. Many common species can be so identified for they are pictured in the catalogs put out by dealers. Few of the books on cacti that are readily available have enough pictures to take the collector far when the plant is really unusual. One then has to rely on technical descriptions. At present the best available book is Borg's "Cacti." This may be had from our Editor. Don't look for too many photographs. It has good technical descriptions of most of the known cacti. Good technical descriptions are simple but therein lies the pitfall. Every descriptive word has a special meaning when describing a plant and the workers in each family of plants have developed a special terminology to describe the peculiarities of each family. Thus to comprehend a description requires practice or better yet a teacher. When you start out naming cacti offhand you are taking up a lifetime work.

## A CACTUS COLLECTOR IN THE ANDES

*An account of a second expedition to the west coast of South America.*

By HARRY JOHNSON

### PART II

During the morning we had been stopped by a stalled bus and had acquired as passenger a young man who was going on to Huaraz. This we lived to regret. It was now evening and we were still far from our destination. Collecting is always a slow process for one is constantly stopping to examine a likely hillside or to take photographs. When a new plant is found it means taking several cuttings, searching for seeds and flowers, making notes, packaging the plants and then tying notes, photographs, herbarium specimens and seeds up in such a way that months later you can sort them all out and match them up again.

Near the *Borzicactus* I had found a most interesting new *Mila*. The Milas are small clustering cacti looking somewhat like small *Mammillarias* but bearing odd and quite pretty, yellow blossoms followed by bronze-green berries. There are quite a number of species known though only three have been described. Unfortunately the three described species are probably only one, for the first known species is extremely variable and the two others are from within its immediate range. A pot full of seedlings will bring you all the types.

We were now reaching the crest of the pass and were working our way up by short switchbacks hoping not to meet a truck coming around a corner in the dusk. It was dark as we started across the puna and to our right, shimmering ghostly white in the moonlight, towering to 22,188 feet, were the snowy peaks of Huascaran and its attendants. How beautiful and eerie they were. Shortly we were plunging downward past small villages and about eleven o'clock drew up at the Gran Hotel which was owned by our young friend. The streets were so narrow we had to park the car in the square in front of the police station.

Early next morning we started down the valley with our friend driving, hoping to reach the Canyon del Pato. Soon we saw another form of *Trichocereus peruvianus* which is one of the few cacti which have very wide distribution in Peru. On a bench near by grew *Borzicactus Fieldianus*. This is the type locality of this species which was discovered in 1922. It forms plants 5' to 8' high. The branches are some 2" in thickness, the ribs tuberculate, low and rounded with a curious tessellate appearance due to the impressed lines dividing the tubercles. The flowers are al-

most closed, orange red, some 3" long. We now know one or two others belonging to this same group which Backeberg has split off into his genus *Clistanthocereus*. It has a ring of hairs at the top of the nectary as does the type of the genus *Borzicactus sepium*. Close by we found the first of a new *Mila* with very stout, coppery branches just beginning to show their buds. Near here I first saw a new undescribed *Matucana* which further on was in bloom. An *Armatocereus* with blue stems, like all the northern members of the genus, grew to 10' tall, the very spiny fruits almost mature. Flower buds were also showing. This genus of tree *Cerei* though hard to separate from *Lemaireocereus* is surely different and easily recognizable. I have found it widely distributed in Peru from north to south and freely growing on both the eastern and western drainages. It will be a difficult task to separate the species as it almost always is with plants which have a wide, geographically contiguous range.

Here I found also a creeping and at times pendent *Borzicactus* with stems 1" thick and S-shaped crimson flowers some 1½"-2" long though none were fully expanded. The ovoid-compressed fruits were ⅝"-¾" in diameter with the axils of the scales filled with wool. The plants were from 2' to 4' long and grew on the steep canyon walls. The spiny stems were somewhat tuberculate. A little lower was another species at first erect then procumbent with quite pronouncedly tubercled ribs the stems an inch in diameter and pale green. It was not in flower or bud and plants were not plentiful. I was looking in particular for the new *Espostoa* below Caras at the Canyon del Pato. Just before reaching Caras I spied it across the river which is here far too deep and swift to ford. At Caras we found a bridge in course of construction but completed except for the approaches, so parking the car we walked across as I hoped to discover some plants on the mountain-side above. Climbing up to the level above the canyon we saw scores of *Melocactus Townsendianus* their red cephalia bright in the late afternoon sunlight. Here among them grew the new *Matucana* the almost straight-tubed, scarlet blossoms 3" to 3½" long. A very lovely thing with longer centrals than *Matucana Haynei* which bears mostly short, bristly spines. The flowers are larger than in the type species and the tube much stouter. Here also grew more of the new *Mila*.

Almost at once we saw a new *Borzicactus*, low and shrubby with the stiff longer branches almost procumbent. The flower was exquisite much larger than the others the perianth widely expanded the segments recurved in a way quite unique in *Borzicactus*. Later, however, I found other species with recurved perianths in southern Peru. The outer perianth was bright red the inner segments suffused with lilac giving the flower a most lovely appearance, quite the daintiest cactus blossom I have seen. The flower tube was quite S-shaped. The stems were 1" to 1 1/4" in diameter very dark copper-green in color, the ribs tubercled, the areoles set with very pungent, stiff spines. Quite different from the two preceding species.

A few hundred feet higher up I found the *Espostoa*. A charming plant growing to perhaps 5' tall with snowy-white wool and yellow spines. Its branches from the base; the rather slender branches bearing a not too profuse pseudoccephalium which is faintly stained with brown. The more I see of the two genera *Espostoa* and *Pseudoespostoa* the more convinced I am that *Pseudoespostoa* cannot be defended as a separate genus. I have seen many species of both. When we were dealing only with *Espostoa lanata* and *Pseudoespostoa melanostele* separated by hundreds of miles one could not be too sure that the small differences were basic i.e. basal branching and shining smooth seeds in *Pseudoespostoa* and lateral branching from a trunk and dull rugose seeds in *Espostoa*. Such differences at best are very feeble to raise a new genus on. However, I am now sure of 4 or 5 other species and the differences between the genera are rapidly disappearing until on this

separation one could never tell with which genus he was dealing. At first I thought I could separate them on elevation, the *Espostoas* seeking about 6,000 feet the *Pseudoespostoas* lower elevations just above the mouths of the canyons. However good this was as far as Huaraz, it fell flat later when I traced *Espostoa lanata* from 2,000 meters to as low as 500 meters from the Paso Abre Porculla to the Rio Marañon.

Next day we devoted the morning to preparing specimens, packing and sorting cuttings and cleaning seeds. It was necessary to ship the specimens to Lima to make room in the car for the human cargo. We drove out of town to the river wash to do this and as the morning was bright and clear had a magnificent view of the snowy peaks of Huascarán, Tulpasaco, Casha and Cajup. Returning to the hotel we sent the car to the square. Hotels in the smaller out of the way places where tourists seldom go are not what the name implies. They are often horrifyingly dirty and extremely primitive. The Gran Hotel here was a classic example. After lunch at a small restaurant on the square we looked for the car. It was gone. We reported it to the police when we could find the hotel keeper, and discovered he had taken his friends to a bull fight some 60 kilometers over the mountains. We moved to a less "pretentious" hotel and at 7:00 p.m. found the car parked in the street. The police captain was very much annoyed with our young friend and promised to jail him overnight as this was not his first offense. Later we sadly discovered he had stolen our supplies of canned food and repacked the boxes. This was the only time during the trip we lost anything.

*To be continued*

## "SO YA WANNA GROW CACTUS"

By WM. MASTRANGEL, *Rocking Horse Cactus Gardens*

### PART III—LIGHT AND SUNSHINE

It is to be remembered that almost all cacti are children of the sun, or let us say lovers of light. The few notable exceptions which most of us know about are the *Epiphyllums*, *Zygocactus* (Xmas Cactus), and a few other tropicals—which prefer the north light or at most a very little filtered sunshine. No cactus should be attempted to be grown in continuous shade—regardless of species.

The big danger is the adjustment of our plants from winter shadiness to spring and summer sunshine. Here in the southwest, we have so much light and warm weather that the problem is not too great, but in northern climes—

such as Montana, Canada, Michigan and northern European countries, where the plants have been wintered in shaded cellars, darkened rooms, etc., one must be careful to make this sudden change of light gradually. One good point to bear in mind, is to have either the pot or flat marked with an "S" showing the south side; this will avoid changing the already toughened south side of the plant to another direction and thus avoiding placing a more tender side toward the hottest light.

Mr. Proctor has ably pointed out, in his recent article in our JOURNAL of March, 1952, about the inadvisability of changing the direction, or greatest source of light on a plant; he points out



very thoroughly that such a change affects the metabolism of a plant thus affecting the future flowering.

If cacti must be changed directly from winter shade to spring sunshine, it is advisable to semi-shade the plants with such contraptions as close lath or fine plastic screen, some even use white-washed glass or thin white muslin to achieve the effect, shortening the periods until by the middle of June the cacti become accustomed to the new location. The dangerous period is between the hours of eleven o'clock in the morning to three in the afternoon. Tall *Cereus*, *Trichocereus*, large *Echinopsis*, *Echinocactus*, *Fero-cactus* and other densely spined species are the least affected by sunlight. Small or young plants, *Mammillaria*, *Rebutia*, *Echinocereus* and certain *Coryphantha* are most affected by sudden sunlight changes. Also the latter named plants require more shade during the middle part of the day.

Cacti that have been under lath house all winter, in order to remain there during summer, require no additional attention. However, changing from glass house to lath house in the spring, requires more care, since there is a sudden temperature change from damp heat to drier air and from filtered sunlight to more direct light. Changing from lath house to open sun should be done early as possible in the spring. In the southwestern states there are very few cacti that can stand the open sun which, because of the few cloudy days and the resulting excess amounts of ultra violet rays, require some shade, such as lath, bushes and trees. This is particularly true in southern Arizona and certain desert regions of Utah, Nevada, New Mexico and southern California. In these parts, the sun from ten-thirty in the morning to four in the afternoon, is very hard on cacti—therefore extreme caution should be used in proper shading. In no case should completed shade be used, but rather a filtered shade such as is produced by bushes, trees, lath, fine screened cloth, unevenly white-washed glass and rocks. Common white muslin and even camouflage netting is used to success in shading the tender plants from excess sun. Even though cacti are children of the sun (meaning that they want sunshine and light), I still have yet to see a cactus that loves a direct sun beating down on it day after day. When this happens, if the plant does not sunburn, it becomes shrivelled in appearance and generally discolors on the south and west sides.

In the northern and eastern parts of the United States and in Canada, where there are less days of full sunshine and more of the cloudy days, the sun problem is not acute. In fact, some localities have a hard time getting enough sun for

flower production.

Do not turn the direction of the pots or flats once the buds have appeared since the change of light may cause the flower buds to dry up and fall off. The only time that it is advisable to change the directions in which the pots are facing is in the case of growing a certain potted plant for a show specimen. Certain *Mammillarias* and *Echinopsis* produce a more even growth of off-shoots by turning the pot one-eighth of a turn every two weeks during the growing season.

Certain cacti, such as most *Opuntias* and older *Cerei*, can adjust themselves to almost any degree of sunshine; however, experience is the best teacher. By observation we can very easily find out how much sun a plant likes. For instance, we learn that the peanut cactus (*Chamaecereus silvestrii*) makes a healthier growth in sunny locations and becomes elongated in shady spots. The same is true of *Trichocereus*, *Echinopsis*, *Cephalocereus*, *Oreocereus*, etc. Growth must be even and *not* thick at the base and thin at the growing center. *Cereus* types should have an even thick growth. *Mammillarias* should be ball-like or keg shaped. By seeing pictures or looking at well-grown specimens at cactus shows, one will find out soon enough the way a healthy cactus should look. Epiphyllums and most night-blooming cacti, because of their tree climbing habits, generally have a thinner growth on the new shoot for a time, fattening up with maturity later in the growing season.

Remember that while proper soil and watering are the most important factors in keeping cacti growing and alive, light and sunshine is most important for *beauty* of growth and the full opening of flowers.

Mistakes will happen, and if you find a plant has sunburned (symptoms—large white or yellow discolorations on south or west side of plant), place it in a shadier spot immediately and give it a little more water, remembering not to change the direction of the plant. In most cases the sick plant will become well again, but generally will always have its sunburn scars, distinguished by large brownish patches.

In summing up:

1. Make all changes to stronger light gradually, using such aids as cloth lath, screened cloth, etc.
2. For best results, and for more flowers, try if possible, to keep all cactus containers marked with an "S" and facing that side to the south whenever possible.
3. In northern or cloudier climates, give cacti more sun; in hot desert, or very sunny climates, use more sun protection.
4. The longer the winter dormant season, the



more tender the plant; use more sun protection for such plants.

5. Use less sun exposure for the Epiphytes.

6. Experience is the best teacher; watch the growth and coloration of your plants, especially on the south and west sides. Your warning signs are any strong discolorations or elongated growth.

7. As a general rule, heavy or densely spined plants can take more sun; lightly spined plants or those with spines that do not shade much of the plant body, require more shade.

Culturally speaking, proper amount of light and sun, produce beautiful healthy growth and

a profusion of flowers. Then too, we cannot judge the amount of sunshine a cactus can take by the locality of its native habitat; a notable example—the common Arizona Fishhook (*M. microcarpa*), although native to the hot deserts of Arizona, makes its most beautiful growth and flowers very well in medium to close lath. In nature, this particular plant is found both under bushes and the open sun. The finest specimens are those found growing under thick bushes, regardless of its many spines.

Although possibly the amount of space between laths in a lath house is not too important

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## AN EXPERIMENT WITH TRICHOCEREUS SPACHIANUS

R. Gräser, *Nachrichtenblatt der Deutschen Kakteengesellschaft*, Number 3, Feb. 1950

Translation by JOHN POINDEXTER

Some friends sent Herr Gräser a New Year's card showing some cacti bursting their way through the roof of his greenhouse. This inspired him to run an experiment to see whether the growing powers of cacti were sufficient to actually accomplish this feat.

Six freshly rooted stems of *Trichocereus spachianus* 4-5 inches high and  $1\frac{1}{2}$ - $1\frac{3}{4}$  inches in diameter were placed with the roots penetrating the space between two flat pieces of iron which served to prevent the plant itself from being pushed down into the ground by the force of its growth. Heavy panes of glass were placed over each plant in such a way that one end of each pane rested on the tip of a plant and the other end rested on some firm support, such as a stone, or an inverted flower pot. Weights of varying sizes were placed on the glass panes. A piece of glass tubing was driven into the soil near each plant so that the upper end of the tubing marked the position of each pane of glass at the start of the experiment. Since only one end of each glass pane was supported by the plant, it was assumed that only half of the weight placed on the pane was effective on the plant. The experiment ran from the first of June to the middle of September. The results are shown in the following table:

PLANT NO.	WEIGHT OF STONE	PRESSURE ON PLANT	INCREASE IN HEIGHT
1.	1300 grams	About 650 , grams	8 cms.
2.	1600	800	9
3.	1900	950	7.5
4.	2200	1100	11
5.	3600	1800	6
6.	8100	4050	10.5



FIG. 52. The slow, terrific pressure of a young Arizona Giant (*Carnegiea gigantea*) has raised this desert tree four feet and the would-be root has become the main stem although it does not support the tree. It also proves Dr. Gräser's contention that pressure does not retard growth since the *C. gigantea* on the left, which carries no weight, has made no more growth than the one carrying the weight. Photo from *Cacti for the Amateur*—Haselton.

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# SPINE CHATS

LADISLAUS CUTAK



A favorite spot for a botanist in southern Mexico is Nizanda, in Oaxaca. A natural rock garden exists there but the railroad is cutting deep into the embankment and slowly but surely eating away this plantsman's paradise. On its steep slopes five different plant families live in comparative harmony but there are other families well represented there also. I only mention five because I'm specifically interested in cacti, agavoids, bromels, aroids and orchids. Bromels exist everywhere—on trees, stems of cacti, rocks, and on the ground. Many of the Tillandsias from aerial perches, upon dropping to the ground, adjust themselves readily to life on the ground. The slender branches of small trees are often crowded with a dwarf bromel, by name *Tillandsia ionantha*, about which I'm going to talk about in length. Lyman B. Smith, the foremost monographer of the Bromeliaceae, considered *T. ionantha* synonymous with *T. erubescens* in his treatment of the family in the *North American Flora* but later placed *T. erubescens* on a dubious list and restored *T. ionantha* to its rightful place.

*Tillandsia ionantha* is a small tufted plant, 3 or 4 inches high, usually stemless or with a very short stalk. A single dense rosette may consist of 30 to 70 silvery scurfy leaves which turn crimson red at the tips when about to bloom. The leaves are stout, narrowly lanceolate-triangular, 60 mm. long and 11 mm. broad at the dilated base. They are white lepidote throughout, but with more coarser spreading scales in the lower half, appearing to the naked eye as if coated with fine grains of sugar. There is no scape, as the sessile flowers emerge from the center of the leaf rosette and are only half visible. The individual flowers are erect and slenderly tubular, about 7 cm. long, with lanceolate acute white membranous sepals and violet and white petals slightly recurved in the apical portion. Stamens and pistil extend beyond the perianth and both are white in the lower half becoming violet toward the top.

*Tillandsia ionantha* is a nice bromel to have in your collection. Since it grows on slender branches of trees or clings to faces of rocks in its native habitat, it should be grown in osmundine (orchid peat) or coarse sandy leafmold for best results. Could be treated like any of the epiphytic cacti. I think all of you readers would enjoy this very attractive little bromel. Try to get it for your collection.

For the cactus picture collector, Harold and Lucile Weight's illustrated article, "Virgin Desert Wonderland," in the March, 1952, *Natural History*, is a pictorial treat. The story is an appeal for preserving Arizona's Organ Pipe National Monument as a first-class example of desert landscape. The Organ Pipe region, we are reminded, fell within our boundaries accidentally, when the Gadsden Purchase was designed primarily to facilitate construction of a southern railroad to the Pacific. The Monument was created in 1937 but as yet is not widely known or appreciated. There are some Arizonians who relish the idea that the Monument was never justified, but all of us hope that it will always remain an unspoiled desert wonderland for posterity. The area is rich in vivid volcanic buttes,

strange stone formations, little-known canyons and exotic Sonoran vegetation. Although the area is named for the second largest native cactus, *Lemaireocereus Thurberi*, the region abounds in many other cactus species as well as in low-growing and arboreal forms of vegetation peculiar to dry regions. This Monument, which was visited by many of the 1949 cactus delegates, is a must for all cactus enthusiasts.

Botanizing tales have a peculiar effect on me. Detective stories, romance novels, murder mysteries and such like hold no appeal at all, but a tale of a plant hunt is relished always. Roy N. Jervis writes about "Botanizing in Oriente Province, Cuba" in the first number of *The Asa Gray Bulletin*, which was revived this year after an absence of about fifty years. Jervis' first trip from the U. S. Naval Base at Guantanamo Bay to Santiago de Cuba was an adventure in mud; and a year later, the story was still the same. The Guantanamo Bay area proved to be a rich collecting ground. *Harrisia*, *Melocactus*, *Dendrocereus*, *Cephalocereus* and several *Opuntias* were plentiful. When the rains diminished in November roads became more passable, but mud-holes seemed to remain. River after river was forded with the water swishing around feet on the floor of the jeep. The trip wound out along the coast toward the high mountains. On almost vertical serpentine cliffs perched Agaves, with creeping *Selenicereus*. A succulent *Pilea* grew among the moist rocks, in some places forming pure stands fifty feet across. In the lower valley *Melocacti* were said to be very common and plants were gathered for shipment to the Michigan Botanical Gardens at Ann Arbor. The dense coastal thicket offered the botanist a decided challenge, but the result was worth the effort. *Lemaireocereus brytrix* was one of the dominant plants but a search for *Dendrocereus nudiflorus* and *Pereskia cubensis* was in vain. Here *Opuntia Dillenii* grew in large clumps and made progress difficult in the more open areas. During the 13 months of collecting, Jervis accumulated over 2,000 numbers, many of them from the serpentine-iron areas of southeastern Oriente, whose existence and distinctive pine flora has not been previously noted by botanists. The more unusual species were sent alive to the Botanical Gardens and more than 75% of them have been started successfully.

In a lengthy technical paper, "Contribution to the Physiology of Development of the Inflorescence and the Single Flower" published in *Portugaliae Acta Biologica*, Series A (1949-1951), pp. 729-784, Flavio Resende treats with the effect of the action of light of low intensity upon the initiation and development of both the inflorescence and the flower of *Bryophyllum daigremontianum* and an undescribed *Kalanchoe*. Resende refers in detail the results obtained during the last three years in experiments on the role of the intensity of illumination on the development of the different parts of the flower. He also deals with the internal correlation processes between the different plant organs during floral development and their differences in relation to correlation processes in the vegetative stage.

## "SO YA WANNA GROW CACTUS"

Continued from page 94

or rather not given much consideration, it is very important to us who grow cacti here in the desert. It seems to me that it should be important in places where sunshine is limited. Here in Arizona we use lath houses that are spaced in three different distances. For cacti that need the least amount of sun, we space the lath about one inch apart; those wanting more sun have lath spaced about one and one-half inches apart. For *Opuntias*, *Astrophytums* and others which do well with lots of sun, lath is spaced about two inches apart. All this—assuming that the lath runs between one inch to one and one-quarter inches in width, and that the lath ceiling in this particular case should not be more than eight feet from the ground. Remember that the higher the lath is from the ground, the smaller becomes the lath shadow and more sun enters. Therefore, if a higher ceiling than eight feet is used, lath must then be placed closer together to achieve the same effect. In the locations where sunlight is scarce, it is wise to use a very open lath. Incidentally, lath house culture is the most ideal, since it is the nearest thing to tree shade. Never run lath east and west.

Next issue—"Air and Ventilation."

## AN EXPERIMENT

Continued from page 94

The experiment shows that even the heaviest weight used here had no appreciable effect on the growth of *T. spachianus* over the period of the experiment. The author noted that there was some bleaching of the stem tip (etiolation) with the heavier weights, but he assumed that this was due to the shading effect of the weight itself.

EDITOR'S NOTE: An interesting coincidence is found in this JOURNAL on page 68. Dr. Dyer shows a picture of a Baobab tree having lifted a slab of stone weighing tons.

## A RARE OPPORTUNITY

*Cephalocereus senilis*

(Old Man of the Mountain)

IN SIZE FROM 3 INCHES TO 5 FEET

FOR SALE AT 60 CENTS PER INCH

WHILE STOCK LASTS.

COLLECTED PLANTS FROM MEXICO.

FITZPATRICK'S CACTUS GARDENS

RFD 3-J

EDINBURG, TEXAS

## FROM MEXICO

My new Cacti Price List of 1952 has just been finished. It contains a good number of new discoveries. If you really are interested in rare Cacti, just write for my list to:

**Fritz Schwarz**  
Apartado 347 San Luis Potosi, SLP Mexico

## MAY SPECIAL

*Opuntia basilaris* major (Giant Beavertail)  
5-6 in. pads..... .60 ea.  
*Mammillaria microparva auricarpa* (Golden Fish-hook) RARE, a new, beautiful golden-spined variety. Plants.....2.50 ea.  
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## SPECIAL REBUTIA CLUSTERS

*Rebutia minuscula* (Red Tom Thumb)......75 ea.  
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*Rebutia senilis* (Hoary Tom Thumb)......75 ea.  
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